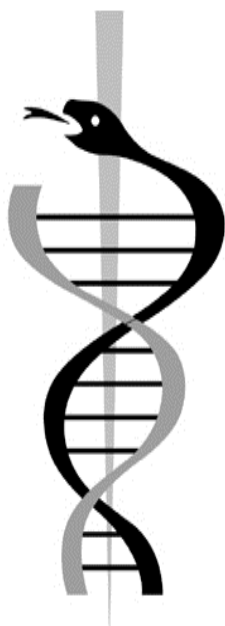


# **COLORADO STATE UNIVERSITY VETERINARY DIAGNOSTIC LABORATORIES**

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## **ANNUAL REPORT 2014**

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**Colorado State University  
Veterinary Diagnostic Laboratories  
300 West Drake  
Fort Collins, CO 80523  
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Fax 970/297-0320  
email: [dlab@colostate.edu](mailto:dlab@colostate.edu)  
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**ARKANSAS VALLEY  
Animal Disease Diagnostic Laboratory  
27847 Road 21/Rocky Ford, CO 81067  
Phone 719/254-6382 Fax 719/254-6055**  
**WESTERN SLOPE  
Animal Diagnostic Laboratory  
425-29 Road/Grand Junction, CO 81504  
Phone 970/243-0673 Fax 970/242-0003**

## **MISSION STATEMENT**

The mission of Colorado State University Veterinary Diagnostic Laboratories is to provide timely, accurate, and pertinent animal disease diagnostic services and educational outreach to veterinarians, animal industries, and animal interests. The Diagnostic Laboratories also will strive to meet the goals of the College of Veterinary Medicine and Biomedical Sciences, and the University, by contributing to research to develop new approaches to disease identification, investigation, and prevention and by contributing to the education of professional veterinary medical, graduate, undergraduate, and postdoctoral students.

## **VISION**

To be a globally recognized leader in veterinary laboratory diagnostics.

## **VALUES**

Accountability  
Collaboration  
Team  
Transparency  
Respect  
Continuous Improvement

## **MESSAGE FROM THE DIRECTOR**

*Every year, we assemble a summary of the activities of the CSU Veterinary Diagnostic Laboratories. We hope you find this information interesting and of use. The activities of the faculty and staff are listed by the calendar year 2014. The testing and disease statistics are by the fiscal year July 1, 2013 to June 30, 2014. Data from all three laboratories of the system are included, although listed separately. Our goal, as always, is to provide quality timely service and meet our Mission as stated above. Please do not hesitate to contact us about this annual report or any other issue.*

Respectfully,

*Barbara E. Fowles*

## DIAGNOSTIC LABORATORY PERSONNEL

<b>FORT COLLINS</b> <b>Avian Diagnostics</b>	Barbara Powers, DVM, PhD, DACVP	Director
	Kristy Pabilonia, DVM, PhD, DACVM	Avian Section Head
	Sarah Millonig	Avian Program Specialist
	Jeruesha Nichols	Avian Program Specialist
	Kyran Cadmus, DVM, MPH	Research Associate
<b>Bacteriology</b>	Doreene Hyatt, PhD	Bacteriology Section Head
	Denise Bolte	Laboratory Technician
	David Hicks	Laboratory Technician
	Cindy Hirota	Laboratory Technician
	Mike Russell	Laboratory Technician
	Lisa Snelling	Laboratory Technician
<b>Chemistry/Toxicology</b>	Dwayne Hamar, PhD	Chem/Tox Section Head
	Kevin Daniels	Laboratory Technician
	Thomas Davis	Research Associate
<b>Clinical Pathology</b>	Linda Vap, DVM, DACVP	Clinical Pathology Section Head
	Paul Avery, DVM, PhD, DACVP	Clinical Pathologist
	Andrea Bohn, DVM, PhD, DACVP	Clinical Pathologist
	Amy MacNeill, BS, DVM, PhD	Clinical Pathologist
	Christine Olver, DVM, PhD, DACVP	Clinical Pathologist
<b>Endocrinology/Special Serology</b>	Mike Lappin, DVM, PhD, DACVIM	E/SS Section Head
	Melissa Brewer	Research Associate
	Jennifer Hawley	Research Associate
	Arianne Morris	Research Associate
<b>Histology</b>	Todd Bass	Laboratory Manager
	Amy Boyd	Laboratory Technician
	Bruce Cummings	Laboratory Technician
	Grant Evans	Laboratory Technician
	Joe McDowell	Laboratory Technician
	Annie Nelson-Wensman	Laboratory Technician
<b>Molecular Diagnostics</b>	Kristy Pabilonia, DVM, PhD, DACVM	Molecular Section Head
	Kirsten Reed	Laboratory Technician
	Diana Sierra-Alzate	Laboratory Technician
	Christina Weller	Laboratory Technician
<b>Office Staff</b>	Connie Heighes	Business Officer/Asst to Director
	Janice Inman	Accounting/Grant Manager
	Tracy Baszler	Computer Services Team Lead
	Carrie Schmer	Computer Services
	Tina Kane	Office Manager/Client Services
	Danielle Goranson	Client Services/Phone
	Pete Grabel	Client Services/Phone
	Michelle McHugh	Client Services/Phone
	Lisa Monzingo	Office Manager/HR Liaison
	Nancy Ault	Office Manager/Sample Receiving
	Cassandra Grothe	Sample Receiving
	Kim Speaker	Sample Receiving
	Tracy Toberman	Sample Receiving
	Michelle Miller	Reception/Administrative Assistant
	Elaine Andersen	Technician/Special Projects
	Cindy Arrieta	Transcription/Administrative Assistant
	Lisa Jackson	Transcription/Administrative Assistant
	Julie Wright	Transcription/Administrative Assistant
<b>Parasitology</b>	Lora Ballweber, DVM, MS, DACVM	Parasitology Section Head
	Jason Williams	Research Associate
<b>Pathology</b>	Barbara Powers, DVM, PhD, DACVP	Pathologist/Director
	Gary Mason, DVM, PhD, DACVP	Pathology Section Head
	Tawfik Aboellail, MVSc, PhD, DACVP	Pathologist
	Patricia Cole, DVM, PhD, DACVP	Pathologist
	Colleen Duncan, DVM, MSc, PhD, DACVP, DACVPM	Pathologist

## DIAGNOSTIC LABORATORY PERSONNEL-cont.

<b>Pathology-continued:</b>	EJ Ehrhart, DVM, PhD, DACVP	Pathologist	
	Chad Frank, DVM, MS, DACVP	Pathologist	
	Sushan Han, DVM, PhD, DACVP	Pathologist	
	Paula Schaffer, DVM, MS, DACVP	Pathologist	
	Terry Spraker, DVM, PhD, DACVP	Pathologist	
	Charlie Davis, DVM	Case Coordinator	
	Lee DeBuse	Laboratory Technician	
	Katherine Luntsford	Laboratory Support	
	Dennis Madden	Laboratory Coordinator	
	Erik K. Themm	Laboratory Technician	
	Lisa Wolfe	Laboratory Support	
	<b>Quality Assurance</b>	Dwayne Hamar, PhD	QA Manager
		Lora Ballweber, DVM, MS, DACVM	QA Assistant Manager
Bob Kaempfe		QA	
<b>TSE Laboratory</b>	Barbara Powers, DVM, PhD, DACVP	TSE Section Head	
	Kathi Wilson	Laboratory Manager	
	Leah Powers	Laboratory Technician	
<b>Virology</b>	Hana Van Campen, DVM, PhD, DACVM	Virology Section Head (Retired 9/14)	
	Christie Mayo, DVM, PhD	Virology Section Head (Started 12/14)	
	Monica Estay	Laboratory Technician	
	Andrew Freistaedter	Laboratory Technician	
	Christina Gates	Laboratory Technician	
<b>ROCKY FORD Laboratory</b>	Gene Niles, DVM, MS	Laboratory Director	
	Loxi Proctor	Laboratory Support	
	Jennifer Boden	Laboratory Technician	
	Dayla Pearl	Laboratory Technician	
	Carol Aragon	Laboratory Technician	
	Jane Carman-Wharry	Microbiologist	
	Tiburcio Guerrero	Custodian	
<b>GRAND JUNCTION Office Staff Laboratory</b>	Don Kitchen, DVM, PhD, DACVP	Laboratory Director	
	Antonia Histia	Administrative Assistant	
	Kim Hannafious	Microbiologist	
	Martina Svetlik	Laboratory Support	
	Alexandra Fenton	Laboratory Support	
	Scott Mullin	General Labor	

## AWARDS, HONORS, AND SERVICE MILESTONES - 2014

BARBARA POWERS – OLIVER P. PENNOCK DISTINGUISHED SERVICE AWARD, 2014

GARY MASON – ZOETIS DISTINGUISHED VETERINARY TEACHER AWARD, 2014

5 Years of Service  
Michelle McHugh

10 Years of Service  
Kim Davis-Speaker  
Bob Hannafious

15 Years of Service  
Doreene Hyatt

20 Years of Service  
Denise Bolte  
Kathi Wilson

25 Years of Service  
Lee DeBuse  
Loxi Proctor

30 Years of Service  
Jane Carman-Wharry

35 Years of Service  
Dennis Madden

## EXTERNAL ADVISORY COMMITTEE MEMBERS

### Member / Industry Representing:

Dr. Joan Bowen/Small Ruminant	5036 ECR 60	Wellington, CO 80549
Mr. Norm Brown/Equine	8167 NCR 11	Wellington, CO 80549
Dr. Gregg Dean/MIP Dept Head	CSU Dept of MIP	Fort Collins, CO 80523
Mr. Terry Fankhauser/Exe Dir/CCA	8833 Ralston Road	Arvada, CO 80002
Dr. Karen Fox/Wildlife/CPW	6060 Broadway	Denver, CO 80216
Dr. Sunny Geiser-Novotny/USDA/APHIS	755 Parfet, Suite 136	Lakewood, CO 80215
Dr. Mike Gotchey/Equine	1878 Lincoln Avenue	Steamboat Springs, CO
Dr. Tim Hackett/VTH Director	CSU VTH	Fort Collins, CO 80523
Dr. Marv Hamann/Mixed Practice	183 Domingo Drive	Pueblo West, CO 81007
Mr. Ed Hansen/Beef Cattle	4554 CR 74E	Livermore, CO 80636
Dr. Jennifer House/Public Health Vet	CO Dept of Public Health & Environment	Denver, CO 80216
Dr. Ron Kollars/Small Animal	1336 W. Elizabeth	Fort Collins, CO 80521
Dr. Larry Mackey/Large Animal	PO Box 336204	Greeley, CO 80632
Dr. Leesa McCue/Mixed Animal	474 1 <sup>st</sup> Avenue	Limon, CO 80828
Dr. Del Miles/Beef Cattle	5626 W. 19th Street, Suite A	Greeley, CO 80634
Ms. Kellee Mitchell/CO Livestock Assoc.	822 7 <sup>th</sup> Street, Suite 210	Greeley, CO 80631
Dr. Chris Orton/Clin Sci Dept Head	VTH/Dept of Clinical Sciences	Fort Collins, CO 80523
Dr. Keith Roehr/State Vet	CO Dept of Agriculture	Denver, CO 80215
Mr. Kenny Rogers/CCA	5151 CR 34	Yuma, CO 80759
Dr. Lou Swanson/Extension	CSU Extension	Fort Collins, CO 80523
Dr. Steve Wheeler/Small Animal	3550 S. Jason Street	Englewood, CO 80110

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Our External Advisory Committee members volunteer their time to meet with us annually and assess our progress, as well as provide input to our future directions. We are grateful for their time and advice, and hope they feel that they are an integral part of the laboratory.

The Diagnostic Laboratories in conjunction with the Department of Microbiology, Immunology, and Pathology provides hands-on educational experiences to senior Professional Veterinary Medical Students in the areas of Pathology, Microbiology, and Parasitology. We also are educating the next generation of veterinary pathologists and microbiologists. Below is a listing of our residents.

### Pathology Residents

Elijah F. Edmondson, DVM  
Laura Hoon-Hanks, DVM  
Greta M. Krafur, MSc, DVM  
Jennifer L. Malmberg, DVM, MA  
Travis Meuten, DVM  
Craig Miller, DVM  
Lauren Radakovich, DVM  
Dan Regan, DVM  
Emily Rout, DVM  
Allison Vilander, DVM

### Microbiology Resident

Dipu Mohan Kumar, MS, PhD

### Comparative Lab Animal Medicine

Jennifer Kopanke, DVM  
Carmen Ledesma, DVM  
Erin Lee, DVM  
Wendy Tuttle, DVM

## EXTERNAL ADVISORY COMMITTEE MEMBERS – 2014



**Back Row:** Gene Niles (Rocky Ford Director), Tracy Baszler (IT Services), Joan Bowen (Small Ruminant), Kacie Reed (IT Services), Don Kitchen (Western Slope Director), Karen Fox (CPW), Kristy Pabilonia (Section Head), Dwayne Hamar (Section Head), Ron Kollars (Small Animal), Barb Powers (VDL Director), Connie Heighes (Business Officer), Charlie Davis (Case Coordinator), Tim Hackett (VTH Director), Leesa McCue (Mixed Animal), and Del Miles (Beef Cattle).

**Front Row:** Marv Hamann (Mixed Practice), Kenny Rogers (CO Cattlemen's Association), Gregg Dean (Section Head), Doreene Hyatt (Section Head), Keith Roehr (State Veterinarian), Ed Hansen (Beef Cattle), Larry Mackey (Large Animal), Norm Brown (Equine), Jennifer House (Public Health Veterinarian), Dean Mark Stetter (Dean of CVMBS), Scott Novogoratz (IT Services), Christie Mayo (Section Head), Sunny Geiser-Novotny (USDA/APHIS), and Steve Wheeler (Small Animal).

**Attended, but not in photograph:** Lora Ballweber (Section Head), Gary Mason (Section Head), Kellee Mitchell (CO Livestock Association), Chris Orton (Department Head), Terry Spraker (Pathology), and Linda Vap (Section Head).

**Absent:** Terry Fankhauser (Executive Director, CO Cattlemen's Association), Melinda Frye (Associate Dean), M. H. Gotchey (Equine), Michael Lappin (Section Head), and Lou Swanson (CSU Extension).

## DIAGNOSTIC LABORATORY FACULTY TEACHING CONTRIBUTIONS - 2014

ERH510	Cancer Biology/E. Ehrhart
MIP192	Microbiology First-Year Seminar/D. Hyatt
MIP334	Food Microbiology/D. Hyatt
MIP335	Food Microbiology Laboratory/D. Hyatt
MIP420	Medical and Molecular Virology/H. Van Campen
MIP540	Biosafety in Research Laboratories/K. Pabilonia
MIP612	Applied Immunology/K. Pabilonia
MIP636	Mechanisms of Viral Infection and Disease/T. Aboellail, H. Van Campen
MIP555	Principles and Mechanisms of Disease/T. Aboellail, P. Cole, E. Ehrhart, S. Han, G. Mason
MIP778	Pathobiology of Laboratory Animals/E. Ehrhart, G. Mason
MIP786A	Practicum--Comparative Gross and Histologic Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, P. Schaffer, T. Spraker
MIP786B	Practicum--Surgical Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, T. Spraker
MIP786C	Practicum for Clinical Pathology Residents/P. Avery, A. Bohn, C. Olver
MIP792C	Bioanalytical and Microscopy Seminar/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, P. Schaffer, T. Spraker
MIP792D	Seminar Anatomic Pathology/T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, G. Mason, P. Schaffer, T. Spraker
MIP796V	General Pathology Group Study/T. Aboellail
MIP796V	Surgical Pathology/B. Powers
MIP615	Ophthalmological Histopathology/E. Ehrhart
VM601	Perspectives in Veterinary Medicine/K. Pabilonia, T. Spraker
VM603	Veterinary Science: Research and Methods/K. Pabilonia
VM610	Foundations Veterinary Medicine/C. Duncan, E. Ehrhart, S. Han
VM623	Veterinary Nutrition and Metabolism/K. Pabilonia
VM638	Veterinary Parasitology/L. Ballweber
VM639	Veterinary Virology/H. Van Campen
VM640	Biology of Disease I/E. Ehrhart, G. Mason
VM648	Food Animal Production and Food Safety/K. Pabilonia
VM650	Veterinary Microbiological Laboratory Techniques/H. Van Campen
VM707	Emerging Infectious Diseases/C. Duncan, K. Pabilonia
VM710	Foundations in Veterinary Medicine/E. Ehrhart
VM711	Foundations in Veterinary Medicine/C. Duncan, T. Spraker
VM714	Veterinary Preventive Medicine/C. Duncan
VM722	Veterinary Pharmacology/L. Ballweber
VM724	Bioanalytic Pathology/P. Cole
VM741	Biology of Disease II/T. Aboellail, P. Cole, C. Duncan
VM742	Biology of Disease III/ T. Aboellail, P. Cole, C. Duncan, S. Han, E. Ehrhart, G. Mason, T. Spraker
VM751	Veterinary Clinical Toxicology/D. Hamar
VM786A	Junior Practicum—Food Animal Diagnostics and Surgery/G. Mason
VM786A	Junior Practicum—Diagnostic Veterinary Parasitology/L. Ballweber
VM786A	Junior Practicum—Emerging and Exotic Diseases of Animals/C. Duncan, K. Pabilonia, T. Spraker
VM786B	Senior Practicum--Clinical Service Necropsy Block/ T. Aboellail, P. Cole, C. Duncan, E. Ehrhart, C. Frank, S. Han, D. Hyatt, G. Mason, P. Schaffer, T. Spraker, H. Van Campen
VM795	Capstone I/L. Ballweber
VM796V	Dermatopathology/P. Cole

**FACULTY TEACHING CONTRIBUTIONS 2014 -continued:**

VS313	Prevention and Control of Livestock Diseases/L. Ballweber, K. Pabilonia
VS581	Global Veterinary Public Health/C. Duncan
VS626	Infertility and Genital Diseases/H. Van Campen
VS642	Ophthalmology/E. Ehrhart
VS648	Food Animal Production/K. Pabilonia
VS703	Postgraduate Medicine III/E. Ehrhart
VS718	Cancer Biology Clinical Practicum/E. Ehrhart



## SCIENTIFIC PUBLICATIONS BY FACULTY MEMBERS AND STUDENTS – 2014

Amsellem PM, Selmic LE, Wypij JM, Bacon NJ, Culp WT, Ehrhart NP, **Powers BE**, Stryhn H, Farese JP. Appendicular Osteosarcoma in Small Breed Dogs: 51 Cases (1986-2011). J AM Vet Med Assoc 245: 203-210, 2014.

**Ballweber LR**, Beugnet F, Marchiondo AA, Payne PA. American Association of Veterinary Parasitologists' Review of Veterinary Fecal Flotation Methods and Factors Influencing Their Accuracy and Use - Is There Really One Best Technique? Vet Parasitol.204:73-80; 2014.

**Ballweber LR** Endoparasite control. Llama and Alpaca Care, 1<sup>st</sup> Edition, Medicine, Surgery, Reproduction, Nutrition, and Herd Health. Cebara C, Anderson D, Tibary A, Van Saan R, Johnson L, eds. Elsevier, St. Louis, MO, pp. 12-16. 2014.

**Ballweber LR** Overview of Fluke Infections in Ruminants. The Merck Veterinary Manual, online. 2014.

**Ballweber LR** Overview of Gastrointestinal Parasites of Pigs, The Merck Veterinary Manual, online. 2014.

**Ballweber LR** Overview of Lungworm Infection. The Merck Veterinary Manual, online. 2014.

Brandt LE, **Ehrhart EJ**, Scherman H, Olver CS, Bohn AA, Prenni JE. Characterization of the Canine Urinary Proteome. Vet Clin Pathol. 43(2):193-205. April 2014.

Burgess B, Noyes N, Bolte D, **Hyatt DR**, Van Metre D, Morley PS. Rapid Salmonella Detection in Experimentally-Inoculated Equine Faecal and Veterinary Hospital Environmental Samples Using Commercially Available Lateral Flow Immunoassays. Eq Vet J. Feb 2014.

Burgess BA, **Weller CB**, **Pabilonia KL**, **Bolte DS**, VanMetre DC, Morley PS. Detection of Different Serotypes of Salmonella enterica in Experimentally Inoculated Equine Fecal Samples by Commercially Available Rapid Tests. J Vet Intern Med, 28(6): 1853-9. 2014.

Burton JH, **Powers BE**, Biller BJ. Clinical Outcome in 20 Cases of Lingual Hemangiosarcoma in Dogs: 1996-2011. Vet Comp Oncol 12:198-204, 2014.

Cadmus J, Palmer RH, **Duncan C**. The Effect of Preoperative Planning Method upon the Recommended Tibial Tuberosity Advancement Cage Size. Vet Surg, online ahead of print Jan 10, 2014.

Clarke L, Simon A, **Ehrhart EJ**, Mulick J, Charles B, **Powers B**, **Duncan C**. Histologia Characteristics and KIT Staining Patterns of Equine Cutaneous Mast Cell Tumors. Vet Pathol 51: 560-562, 2014.

**Cole PA**, **Bishop JV**, Beckstead JA, Ryan RO. Effect of Amphotericin B Nanodisks on *Leishmania major* Infected Mice. Pharmaceutica Analytica Acta, Pharm Anal Acta 5:312. 2014.

Dadone L, Garner MM, Klaphake E, Johnston MS, **Han S**. Anaplastic Mandibular Carcinoma in a Meerkat (*Suricata suricatta*). Journal of Zoo Wildlife Medications (45(2):413-416, 2014.

Delaney MA, Colegrove KM, **Spraker TR**, Zuerner RL, Galloway RL, Gulland FM. Isolation of Leptospira from a Phocid: Acute Renal Failure and Mortality from Leptospirosis in Rehabilitated Northern Elephant Seals (*Mirounga angustirostris*), California, USA. J Wildl Dis. 50(3):621-7. May 2014.

**Duncan CG**, Dickerson B, **Pabilonia KL**, Miller A and Gelatt T. Prevalence of *Coxiella burnetii* and Brucella spp in Tissues From Subsistence Harvested Northern Fur Seals (*Callorhinus ursinus*) of St. Paul Island, Alaska. Acta Vet Scand, 56(1):67. 2014.

**Duncan CG**, Tiller R, Mathis D, Stoddard R, Kersh GJ, Dickerson B, Gelatt T. Brucella Placentitis and Seroprevalence in Northern Fur Seals (*Callorhinus ursinus*) of the Pribilof Islands, Alaska. JVDI 6; 26(4): 507-512. 2014.

**Edmondson EF**, Bright JM, Halsey CH, **Ehrhart EJ**. Pathologic and Cardiovascular Characterization of Pheochromocytoma-Associated Cardiomyopathy in Dogs. Vet Pathol. May 2014.

## SCIENTIFIC PUBLICATIONS 2014–continued:

**Edmondson EF**, Hess AM, **Powers BE**. Prognostic Significance of Histologic Features in Canine Renal Cell Carcinomas: 70 Nephrectomies. *Vet Pathol*, 2014.

Engel S, Hilling KM, **Meuten TK**, **Frank CB**, Marolf AJ: Glioblastoma Multiforme with Hypodipsic Hyponatremia in a 7-month-old Golden Retriever. *J Am Anim Hosp Assoc*, On-line 2014.

Flynn P, **Duncan CG**, Palmer R, Duerr FM. In Vitro Incidence of Fibular Penetration With and Without the Use of a Jig During Tibial Plateau Leveling Osteotomy. *Vet Surg*; 43(4): 495-9. 2014.

Gadomski BC, McGilvray KC, Easley JT, Palmer RH, **Ehrhart EJ**, Haussler KK, Browning RC, Santoni BG, Puttlitz CM. An In Vivo Ovine Model of Bone Tissue Alterations in Simulated Microgravity Conditions. *J Biomech Eng*. 6(2):021020. 2014.

Gaudreault NN, **Mayo CE**, Jaspersen DC, Crossley BM, Breitmeyer RE, Johnson DJ, Ostlund EN, MacLachlan NJ, Wilson WC. Whole Genome Sequencing and Phylogenetic Analysis of Bluetongue Virus Serotype 2 Strains Isolated in the Americas Including a Novel Strain From The Western United States. *J Vet Diagn Invest*. Jun 10;26(4):553-557. 2014.

Halsey CH, Worley DR, Curran K, Charles JB, **Ehrhart EJ**. The Use of Novel Lymphatic Endothelial Cell-Specific Immunohistochemical Markers to Differentiate Cutaneous Angiosarcomas in Dogs. *Vet Comp Oncol*. Mar 5, 2014.

**Han S**, Mansfield KM. Severe Hoof Disease in Free-Ranging Roosevelt Elk (*Cervus elaphus roosevelti*) in Southwestern Washington, USA. *Journal of Wildlife Diseases*. Vol. 50(2): 259-270. 2014.

Hatzel JN, Bouma GJ, Cleys ER, Bemis LT, **Ehrhart EJ**, McCue PM. Identification of Heat Shock Protein 10 Within the Equine Embryo, Endometrium, and Maternal Peripheral Blood Mononuclear Cells. *Theriogenology*, Published Online: November 2014.

Hazenfield KM, Nylund A, Valdez-Martinez A, Griffin L, Goh C, Mackay C, **Duncan C**, Palmer R, Duerr F. Accuracy of a Radiographic Stitching Technique to Measure Tibial Plateau Angle in Large and Giant Breed Dogs. *Vet Comp Orthop Traumatol* 27(3): 230-5. 2014.

Kennedy KC, Perry J, **Duncan CG**, Duerr, FM. Long Digital Extensor Tendon Mineralization and Cranial Cruciate Ligament Rupture in a Dog: A Case Report and Review of the Literature. *Vet Surg*; 43(5): 593-7. 2014.

Kirkley KS, Madl JE, **Duncan C**, Gulland FM, and Tjalkens RB. Chronic Domoic Acid-Induced Seizure in California Sea Lions is Associated with Neuroinflammatory Brain Injury. *Aquatic Tox*; 156: 259-268. 2014.

**Krafsur GM**, **Ehrhart EJ**, Ramos-Vara J, **Mason GL**, Sarren F, Adams B, Hanns C, **Spraker TR**, **Duncan CG**. Histomorphologic and Immunohistochemical Characterization of a Cardiac Purkinjeoma in a Bearded Seal (*Erignathus barbatus*). *Case Reports in Vet Med*, Article ID 103279. 2014.

Kuzmina TA, Lyons ET, **Spraker TR**. Anisakids (Nematoda: Anisakidae) from Stomachs of Northern Fur Seals (*Callorhinus ursinus*) on St. Paul Island, Alaska: Parasitological and Pathological Analysis. *Parasitol Res*. 113(12):4463-70. 2014.

Lyons ET, Kuzmina TA, Carie JL, Tolliver SC, **Spraker TR**. Current (2012-2013) Prevalence of Hookworms (*Uncinaria lucasi*) in Northern Fur Seals (*Callorhinus Ursinus*) on St. Paul Island, Alaska. *Vestnik Zoologii* 48(3): 221-230. 2014

MacLachlan NJ, **Mayo CE**, Smith BP. Bluetongue, in Smith, B.P. (Eds). *Large Animal Internal Medicine*, 5<sup>th</sup> ed., Elsevier Science Publishing Company, New York, NY, 745-750. 2014.

Madl JE, **Duncan CG**, Stanhill JE, Tai PY, **Spraker TR**, Gulland FM. Oxidative Stress and Redistribution of Glutamine Synthetase in California Sea Lions (*Zalophus californianus*) with Domoic Acid Toxicosis. *J Comp Pathol*. 150(2-3):306-15. 2014.

## SCIENTIFIC PUBLICATIONS 2014–continued:

**Malmlov A**, Breck S, Fry T, **Duncan C**. Serological Survey for Cross-Species Pathogens in Urban Coyotes. *J Wild Dis*; 50(4): 946-950. 2014.

**Malmlov A**, Campbell T, Monnet E, **Miller CA**, Miceli B, **Duncan CG**. Case report: Diagnosis, Surgical Treatment, Recovery and Eventual Necropsy of a Leopard (*Panthera pardus*) with Thyroid Carcinoma. *Case Reports in Vet Med*, vol. 2014, Article ID 562934. 2014.

**Mayo CE**, Mullens BA, Reisen WK, Osborne CJ, Gibbs EP, Gardner IA, MacLachlan NJ. Seasonal and Interseasonal Dynamics of Bluetongue Virus Infection of Dairy Cattle and *Culicoides sonorensis* Midges in Northern California--Implications for Virus Overwintering in Temperate Zones. *PLoS One*. 9(9):e106975. 2014.

**Mayo CE**, Osborne CJ, Mullens BA, Gerry AC, Gardner IA, Reisen WK, Barker CM, Maclachlan NJ. Seasonal Variation and Impact of Waste-Water Lagoons as Larval Habitat on the Population Dynamics of *Culicoides sonorensis* (Diptera:Ceratopogonidae) at Two Dairy Farms in Northern California. *PLoS One*. 9(2):e89633. 2014.

McGrew AK, **Ballweber LR**. PCR for Parasites. *Bovine Veterinarian*. September 18-21, 2014.

McGrew AK, **Ballweber LR**, Moses SK, Stricker CA, Beckmen KB, Salman MD, O'Hara TM. Mercury in Gray Wolves (*Canis lupus*) in Alaska: Increased Exposure Through Consumption of Marine Prey. *Sci Total Environ* 468-469:609-613; Epub: 2014.

**McLeland SM**, Lunn KF, **Duncan CG**, Refsal KR, Quimby JM. Relationship between Serum Creatinine, Serum Gastrin, Calcium-phosphorus Product and Uremic Gastropathy in Cats with Chronic Kidney Disease. *J Vet Intern Med*; 28(3): 827-37. 2014.

Mills SW, Musil KM, Davies JL, Hendrick S, **Duncan CG**, Jackson ML, Kidney BA, Philibert H, Wobeser B, Simko E. Prognostic Value of Histologic Grading for Feline Mammary Carcinoma: A Retrospective Survival Analysis. *Vet Pathol*; July 2014.

Monello RJ, Powers JG, Hobbs NT, **Spraker TR**, Watry MK, Wild MA. Survival and Population Growth of a Free-Ranging Elk Population with a Long History of Exposure to Chronic Wasting Disease. *Journal of Wildlife Management*; 78(2):214-223. 2014.

Nelson BB, **Edmondson EF**, Sonis JM, **Frank CB**, Valdes-Martinez A, Leise BS: Multiple Skeletal Metastases from a Penile Squamous Cell Carcinoma in a Horse. *Equine Vet Educ*, On-line 2014.

Osborne CJ, **Mayo CE**, Mullens BA, Maclachlan NJ. Estimating *Culicoides sonorensis* Biting Midge Abundance Using Digital Image Analysis. *Med Vet Entomol*. Dec;28(4):461-4. 2014.

**Pabilonia KL**, **Cadmus KJ**, Lingus TM, **Bohte DS**, **Russell MM**, Van Metre DC and Erdman MM. Environmental Salmonella in Agricultural Fair Poultry Exhibits in Colorado. *Zoonoses Public Health*, 61(2):138-44. 2014.

Paoloni M, Webb C, Mazcko C, Cherba D, Hendricks W, Lana S, **Ehrhart EJ**, Charles B, Fehling H, Kumar L, Vail D, Henson M, Childress M, Kitchell B, Kingsley C, Kim S, Neff M, Davis B, Khanna C, Trent J. Prospective Molecular Profiling of Canine Cancers Provides a Clinically Relevant Comparative Model for Evaluating Personalized Medicine (PMed) Trials. *PLoS One*. Mar 17;9(3):e90028. 2014.

Pepin KM, Spackman E, Brown JD, **Pabilonia KL**, Garber LP, Weaver JT, Kennedy DA, Patyk KA, Huyvaert KP, Miller RS, Franklin AB, Pedersen K, Bogich TL, Rohani P, Shriner SA, Webb CT, Riley S. Using Quantitative Disease Dynamics as a Tool for Guiding Response to Avian Influenza in Poultry in the United States of America. *Prev Vet Med*, 113(4):376-97. 2014.

Powers JG, **Duncan CG**, **Spraker TR**, Schuler BA, Hess SC, Faford JK, Sin H. Environmental Conditions Associated with Lesions in Introduced Free-Ranging Sheep in Hawai'i. *Pacific Science* 68:(1)65-74. 2014.

## SCIENTIFIC PUBLICATIONS 2014–continued:

- Powers JG, Monello RJ, Wild MA, **Spraker TR**, Gionfriddo JP, Nett TM. Effects of GonaCon Immunocontraceptive Vaccine in Free-Ranging Female Rocky Mountain Elk (*Cervus elaphus nelsoni*) Wildlife Society Bulletin; 434. p1-7. 2014.
- Raabis SM, Byers SR, **Han S**, Callan RJ. Epizootic Hemorrhagic Disease in a Yak. Canadian Veterinary Journal. 55(4): 369-372. 2014.
- Ramos-Vara JA, **Frank CB**, DuSold D, Miller MA: Immunohistochemical Expression of Melanocytic Antigen PNL2, Melan A, S100 and PGP 9.5 in Equine Melanocytic Neoplasms. *Vet Pathol* 51(1):161-166. 2014.
- Root JJ, Shriner SA, Bentler KT, Gidlewski T, Mooers NL, Ellis J W, **Spraker TR**, VanDalen KK, Sullivan HJ, Franklin AB. Extended Viral Shedding of a Low Pathogenic Avian Influenza Virus by Striped Skunks (*Mephitis mephitis*). PLoS One. 9(1):e70639. 2014.
- Root JJ, Shriner SA, Bentler KT, Gidlewski T, Mooers NL, **Spraker TR**, VanDalen KK, Sullivan HJ, Franklin AB. Shedding of a Low Pathogenic Avian Influenza Virus in a Common Synanthropic Mammal--the Cottontail Rabbit. PLoS One. 9(8):e102513. 2014.
- Ryseff JK, **Duncan C**, Sfiligoi G, Avery PR. Gamna-Gandy bodies: A Case of Mistaken Identity in the Spleen of a Cat. *J Vet Clin Path* 41(1): 94-100. 2014.
- Scotch M, Lam TT, **Pabilonia KL**, **Anderson T**, Baroch J, Kohler D, DeLiberto TJ. Diffusion of Influenza Viruses Among Migratory Birds with a Focus on the Southwest United States. *Infect Genet Evol*, 26: 185-93. 2014.
- Seelig DM, Avery P, Webb T, Yoshimoto J, Bromberek J, **Ehrhart EJ**, Avery AC. Canine T-zone Lymphoma: Unique Immunophenotypic Features, Outcome, and Population Characteristics. *J Vet Intern Med*. 28(3):878-86. 2014.
- Shinoda H, Legare ME, **Mason GL**, Berkbigler JL, Afzali MF, Flint AF, Hanneman WH. Significance of ER $\alpha$ , HER2, and CAV1 Expression and Molecular Subtype Classification to Canine Mammary Gland Tumor. *J. Vet. Diagn. Invest*. 26(3):390-403. 2014.
- Shoeneman JK, **Ehrhart EJ**, Charles JB, Thamm DH. Survivin Inhibition via EZN-3042 in Canine Lymphoma and Osteosarcoma. *Vet Comp Oncol*. June 2014.
- Soffler C, Bosco-Lauth AM, **Aboellail TA**, Marolf AJ, Bowen RA. Pathogenesis of Percutaneous Infection of Goats with *Burkholderia pseudomallei*: Clinical, Pathologic, and Immunological Responses in Chronic Melioidosis. *Intl Journal of Experimental Pathology* 95(2):101-119. 2014.
- Spraker TR**, Kuzmina TA, Lyons ET, Tift M, Raverty S, Jaggi N, Crocker DE. Causes of Mortality in Pre-weaned Northern Elephant Seal Pups (*Mirounga angustirostris*, Gill, 1866), Año Nuevo State Reserve, California. *J Vet Diagn Invest*. P26 (2):320-326. 2014.
- Torres-Henderson C, Hesser J, **Hyatt DR**, Hawley J, Brewer M, Lappin MR. Pilot Study to Evaluate the Role of Mycoplasma Species in Cat Bite Abscesses. *J Feline Med Surg*. Mar 2014.
- Yoshikawa H, Maranon DG, Battaglia CL, **Ehrhart EJ**, Charles JB, Bailey SM, LaRue SM. Predicting Clinical Outcome in Feline Oral Squamous Cell Carcinoma: Tumor Initiating Cells, Telomeres and Telomerase. *Vet Comp Oncol*. Sept 2014.

## ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS - 2014

Aaron T, Phillips, Olson KE, **Aboellail TA**, Smeyne RJ, Tjalkens RB. Alphavirus-Manganese Interactions and Dopaminergic Neurodegeneration. Characterizing Histological Lesions and Immunohistochemical Reactivity of Alphaviruses in Outbred CD-1 Mice. 12th Annual Meeting of the Front Range Neuroscience Group. Fort Collins, CO. December 2014.

**Ballweber LR**. Anthelmintic Resistance in GI Nematodes of US Cattle – Where Are We and What Does the Future Hold? Center for Veterinary Health Sciences Annual Fall Conference. Stillwater, OK. November 2014.

Beck JA, Miller MA, **Frank CB**, Dusold D, Ramos-Vara JA. Napsin A Immunohistochemistry in the Diagnosis of Primary Pulmonary Carcinomas in Dogs. American College of Veterinary Pathologists Meeting: Atlanta, GA. November 2014.

Carlson JC, **Hyatt DR**, Ellis JW, Pipkin DR, Mangan A, **Russell MM**, **Bolte DS**, Engeman RM, DeLiberto TJ, Linz GM. Epidemiology and Antimicrobial Resistance of *Salmonella enterica* from European Starlings in Concentrated Animal Feeding Operations. USDA, APHIS, Wildlife Services, National Wildlife Disease Program Annual Meeting. Ft. Collins, CO. September 2014.

Carlson JC, **Hyatt DR**, Ellis JW, Pipkin DR, Mangan A, Russell MM, **Bolte DS**, Engeman RM, DeLiberto TJ, Linz GM. *Salmonella enterica* Contamination by European Starlings in Concentrated Animal Feeding Operations USDA, APHIS, Wildlife Services, National Wildlife Disease Program Annual Meeting. Ft. Collins, CO. October 2014.

Cerda JR, Buttke D, **Ballweber LR**. Long-term Trends in Prevalence and Ecology of *Echinococcus* in Wolves (*Canis lupus*) in Isle Royale National Park, Michigan, USA. European Scientific Counsel Companion Animal Parasites *Echinococcus* 2014, Vilnius, Lithuania. October 2014.

Cerda JR, **Malmlov A**, Kirk CM, O'Hara T, Beckmen KB, **Ballweber LR**. An Update on *Echinococcus* in Wild Canids in Alaska. European Scientific Counsel Companion Animal Parasites *Echinococcus* 2014, Vilnius, Lithuania. October 2014.

Cerda JR, **Malmlov A**, Kirk CM, O'Hara T, Beckmen KB, **Ballweber LR**. Prevalence and Geographical Distribution of *Echinococcus* in Wolves (*Canis lupus*) and Arctic Foxes (*Vulpes lagopus*) in Alaska. Wildlife Disease Association 63<sup>rd</sup> Annual International Conference, Albuquerque, NM. July/Aug 2014.

Dadone L, **Han S**, Foxworth S, Klaphake E, Johnston MS, Barrett M. Diagnosis and Management of Pedal Osteitis and Pedal Fractures For a Large Herd of Reticulated Giraffes (*Giraffa Camelopardalis Reticulata*). 2014.

Demme K, Lapinskas S, Small M, **Ballweber L**, Hess T. Fecal Egg Counts in Feral Horses. Celebrate Undergraduate Research and Creativity. Colorado State University, Fort Collins, CO. April 2014.

Dirsmith K, **Spraker T**, Rao S, Gelatt T, **Duncan C**. Retrospective Review of Northern Fur Seal (*Callorhinus ursinus*) Pup Body Measurements: St Paul Island, Alaska (1986-2013). Celebrate Undergraduate Research and Creativity Symposium (CURC). Award winner: High honors. Fort Collins, CO. 2014.

Doster E, Burgess BA, Elam J, **Pabilonia KL**, Slovis N, Morley PS. Detection of *Salmonella enterica* in the Dairy Environment Using a Commercially Available Lateral Flow Immunoassay. Conference of Research Workers in Animal Diseases. Chicago, IL. 2014.

**Duncan C**, Tiller R, Mathis D, Stoddard R, Kersh GJ, Dickerson B, Gelatt T. Brucella Placentitis and Seroprevalence in Northern Fur Seals (*Callorhinus ursinus*) of the Pribilof Islands, Alaska. Alaska Marine Science Symposium, Anchorage, Alaska. 2014.

Fagre AC, Burgess BA, Johnston M, **Pabilonia KL** and Morley PS. Improved Characterization of Salmonella Enterica Shedding Among Reptile Patients at the James L. Voss Veterinary Teaching Hospital. Conference of Research Workers in Animal Diseases. Chicago, IL. 2014.

## ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS – 2014 - cont:

Fisher S, Burgess W, Hines K, **Mason G**, Owiny J. Carbon Dioxide-Induced Pulmonary Hemorrhage. American Association for Laboratory Animal Science. Northglenn, CO. October 2014.

**Frank C, Mason G, Schaffer P**: Field Necropsy: Case-Based Approach to Diagnostic Investigation and Sampling. Annual Conference for Veterinarians: Fort Collins, CO. 2014.

Gibas M, Charles B, **Ehrhart EJ**. Development of an Immunocytochemistry Mast Cell Tumor Profile. Clinical Series Section. American College of Veterinary Pathologists Annual Meeting. Atlanta GA. November 2014.

Gilbert A, Kohler D, Rigg T, Fischer J, **Spraker TR**, Fox K, VerCauteren K. A Recent Epizootic of Skunk Rabies and Associated Spillover in Northern Colorado, USA. Waikoloa, HI. March 2014.

**Hoon-Hanks L**, Fox K, **Ehrhart EJ**. Anterior Segment Dysgenesis in Mule Deer Fawns. Comparative Ocular Pathology Society Annual Meeting. Fort Collins CO. September 2014.

**Hyatt DR**. The Role of Colorado State University's Veterinary Diagnostic Lab's Bacteriology Section in Biosafety and Zoonotic Disease Surveillance. Guest lecture, Infectious Disease Course. Perugia, Italy. October 2014.

**Hyatt DR**, Carlson JC, Linz GM, Mangan A, Bentler KT, **Russell MM**, Engleman RM. Epidemiology and Antimicrobial Resistance of *Salmonella enteric* from European Starlings in Concentrated Animal Feeding Operations. Proceedings of the 3<sup>rd</sup> Prato Conference on the Pathogenesis of Bacterial Diseases of Animals, Prato Italy. October 2014.

Johnson S, Gill V, Burek K, **Ehrhart EJ**, Charles B, Orton C, **Duncan C**. Degenerative and Infectious Change in Heart Valves from Northern Sea Otters. CVMBBS Research Day. Fort Collins CO. 2014.

Kirkley KS, Madl JE, **Duncan C**, Gulland FM, and Tjalkens RB. Looking Beyond the Neuron: Neuroinflammation in California Sea Lions Exposed to Domoic Acid. CVMBBS Research Day. Fort Collins CO. 2014.

**Kitchen D**. Oak Poisoning in Yearling Cattle: The Clinical History of Exposure to Oak (*Quercus* sp.) and the Presence of Acute Renal Nephrosis are Diagnostic for Oak Poisoning. American Association of Veterinary Laboratory Diagnosticians Annual Meeting. Kansas City, MO. October 2014.

Kuzmina TA, Lyons, ET, **Spraker TR**, Gelatt T, Williams M. Monitoring of the Gastrointestinal Helminths-Community Structure of Northern Fur Seals (*Callorhinus ursinus Linnaeus 1758*), St. Paul Island, Alaska. Alaska Marine Science Symposium. Anchorage, Alaska. January 2014.

Linke L, **Pabilonia KL**, Wilusz J, Fruehauf J, Magnuson R, **Han S**, Olea-Popelka F., Salman MD. A Novel Avian Influenza Antiviral Technology for Poultry: Proof-of-principle in an Avian Model. American Association of Avian Pathologists Annual Convention. Denver, CO. July 2014.

Lyons, ET, Kuzmina TA, Carrie J, **Spraker, TR**. *Uncinaria lucasi* and Uncinariosis: Monitoring Studies of Northern Fur Seals (*Callorhinus ursinus Linnaeus 1758*), St. Paul Island, AK. Alaska Marine Science Symposium. Anchorage, Alaska. January 2014.

**Malmberg J**, Dubielzig D, **Ehrhart EJ**. Canine and Feline Retinal Lymphoma: A Retrospective Study of 12 Cases. Comparative Ocular Pathology Society Annual meeting, Fort Collins, CO. September 2014.

Mansfield K, **Han S**, Evans N. Hoof Disease in Southwestern Washington. European Wildlife Disease Association, Edinburg Scotland. August 2014.

Mansfield K, **Han S**. Elk Hoof Disease in Washington State. Wildlife Disease Association, Albuquerque NM, USA. July 2014.

**Mason, GL**. Pathology of Small Ruminant Species. Annual Convention of the American Veterinary Medical Association. Denver, CO. July 2014.

## **ABSTRACTS, POSTERS, PROCEEDINGS, AND SCIENTIFIC PRESENTATIONS – 2014 - cont:**

**Mason GL, Frank CB, Schaffer, PA.** Field Necropsy: Case-based Approach to Diagnostic Investigation and Sampling, 57th Annual Conference for Veterinarians. Loveland, CO. April 2014.

**McGrew AK, Zarlenga D, Ballweber LR.** Use of Conventional PCR as a Tool to Monitor Gastrointestinal Strongyle Populations in US Cattle. American Association of Veterinary Parasitologists, 59<sup>th</sup> Annual Meeting, Denver, CO. July 2014.

McGuire A, Fauver J, Ricoa A, **Aboellail TA**, Humec G, Miedema K, Quackenbush S, Hawkinson A, Schountz T. Immune Dynamics in Rodent Reservoirs Infected with Hantaviruses. Characterized Histological Lesions of Hamsters Infected with Pirital Virus as well as Deer Mice Infected Maporal Virus. American Society for Virology, 33rd Annual Meeting. Fort Collins, CO. June 2014.

Nelson BB, Kawcak CE, **Ehrhart EJ**, Goodrich LR. A Comparison of Radiofrequency Probe and Sharp Transection for Tenoscopic-Guided Desmotomy of the Accessory Ligament of the Superficial Digital Flexor Tendon. 41st World Veterinary Orthopaedic Congress. Breckenridge, CO. March 2014.

Nelson BB, Kawcak CE, **Ehrhart EJ**, Goodrich LR. Proximal Check Ligament Transection Methods. American College of Veterinary Surgeons Surgical Summit. San Diego, CA. October 2014.

Nolan MW, Marolf AJ, **Ehrhart EJ**, Kraft SL, Engel S, Whalen LR, Yoshikawa H, Golden AE, Wasserman TH, LaRue SM. Pudendal Nerve and Internal Pudendal Artery Damage May Contribute to Radiation-Induced Erectile Dysfunction. Radiat Res Soc, Las Vegas NV. September 2014.

**Pabilonia KL.** Backyard Poultry Flocks – Their Structure, General Practices and Related Food Safety Risks. American Veterinary Medical Association Convention. Denver, CO. July 2014.

**Pabilonia KL.** Poultry Medicine for the Agricultural Veterinarian. Colorado Veterinary Medical Association Annual Convention. Loveland, CO. Sept. 2014.

**Pabilonia KL.** Public Health Challenges of Influenza A Viruses. Colorado Veterinary Medical Association Annual Convention. Loveland, CO. Sept. 2014.

**Pabilonia KL.** Salmonella in Backyard Poultry: Which Came First – the Chicken or the Egg? Colorado Veterinary Medical Association Annual Convention. Loveland, CO. Sept. 2014.

Pedersen K, **Pabilonia KL**, **Anderson TD**, Bevins SN, Hicks CR, Kloft JM, DeLiberto TJ. Widespread Detection of Antibodies to Leptospira in Feral Swine in the United States. Annual International Conference of the Wildlife Disease Association. Albuquerque, NM. 2014.

Ramos-Vara JA, **Frank CB**, Dusold D, Miller MA: Pax8 as an Immunohistochemical Marker of Thyroid Differentiation in Canine Thyroid Neoplasia. American College of Veterinary Pathologists Meeting: Atlanta, GA. November 2014.

Reimschuessel R, Nemser SM, Guag J, Grabenstein M, Clothier KA, Marks SL, Byrne B, **Pabilonia KL**, **Cadmus KJ**, Sanchez S, Rajeev S, Frana TS, Jergens AE, Ensley S, Thakur S, Byrum B, Cui J, Zhang Y, Erdman MM, Rankin S, Das S, Daly R, Ruesch L, Lawhon SD, Zhang S, Baszler T, Dias-Campos D, Okwumabua O, Hartman F. Salmonella Prevalence in Pets. American Association of Veterinary Laboratory Diagnosticians Annual Conference. Kansas City, MO. October 2014.

**Spraker, TR**, Kuzmina TA, Lyons, ET, Gelatt T, Williams M. Decline of Gastric Lesions in the Stomachs of Northern Fur Seals (*Callorhinus ursinus*) Associated with a Decline in Abundance of Gastric Nematodes. Alaska Marine Science Symposium. Anchorage, Alaska. January 2014.

## **PRESENTATIONS/OUTREACH TO THE PUBLIC - 2014**

**Ballweber LR.** American Veterinary Medical Association Career Transitions Lunch Program. Careers in Diagnostic Medicine. July 2014.

**Ballweber LR.** Common Parasites of Dogs and Cats in Shelters, Shelter Medicine for Animal Welfare Professionals, Pueblo Animal Services. October 2014.

**Kitchen D.** Goat Herd Management and Disease Prevention. Local Meeting, Grand Junction, CO. Sept. 2014.

**Niles G.** An Overview of the CSU Veterinary Diagnostic Laboratories System. Rocky Ford Lions Club. Rocky Ford, CO. November 2014.

**Niles G.** 2014 Forage Nitrate Levels and Coliform Testing on Water Used for Irrigation. Arkansas Valley Agriculture Research Center Board of Directors Meeting. Rocky Ford, CO. 2014.

**Pabilonia KL.** Diagnostics, Sampling and Laboratory Submission for Foreign Animal Disease Cases. Foreign Animal Disease Training Course, Brush, CO and Grand Junction, CO. 2014.

**Pabilonia KL.** Poultry and Public Health: Healthy Living with Chickens. Colorado School of Public Health seminar, Fort Collins, CO. April 2014.

**Spraker TR.** USDA/APHIS Wildlife Services Training for Wildlife Biologists. Necropsy Techniques and Tissue Collection in Birds, Carnivores, and Pigs. National Wildlife Research Center, Fort Collins CO. September 2014.

**Spraker TR.** International Wildlife Training Course, Necropsy Techniques and Tissue Collections. National Wildlife Research Center, Fort Collins, CO. 17-21 November 2014.

**Van Campen, H.** Vaccination Strategies for Horses for Northern Colorado Dressage Association. February 2014.



## ONGOING FUNDED CONTRACTS AND GRANTS - 2014

- Ballweber LR (PI).** Intervet/Schering-Plough Clinical Trial. Merck and Company, Inc. 11/27/12-12/31/13. \$64,386.
- Ballweber LR (PI).** Use of Molecular Techniques to Identify the Genus of Strongyles Through Their Eggs in Cattle Fecal Samples. Merck Animal Health. 1/1/14-12/13/14. \$60,000.
- Ballweber LR (PI), McArt JAA (Co-Invest), and Callan RL (Co-Invest).** National Center for Veterinary Parasitology. Individual Animals Versus the Dung Pile: Which Sampling Strategy is Best for Herd-Based Fecal Egg Count Surveillance Programs? Merck Animal Health. 12/1/13-11/30/14. \$6,350.
- Duncan CG (PI).** Coxiella and Brucella in Northern Fur Seals. North Pacific Research Board. 6/17/13-6/30/15. \$55,242.
- Duncan CG (PI).** *Coxiella burnetii* in Northern Sea Otters in Alaska. North Pacific Research Board. 7/1/13-6/30/15. \$47,413.
- Duncan CG (PI), Spraker TS (Co-Invest), and Pabilonia KL (Co-Invest).** Estimation of Prevalence Optimization of Diagnostic Strategies for *Coxiella burnetii* in Pacific Marine Mammals. National Oceanic and Atmospheric Administration. 8/1/12-7/31/14. \$100,000.
- Ehrhart E (PI).** Instructive Biologic Scaffold for Tissue Regeneration following Trauma to Extremities. ACell, Inc. 7/1/12-8/30/15. \$1,500,000.
- Ehrhart E (Co-Invest).** Biodegradable Polymers for Injury Treatment. Department of Defense. 6/2011-6/2014. \$1,286,000.
- Ehrhart E (Co-Invest).** Discovery of Novel Protein, Blood, and Epigenetic Biomarkers of Lymphoma Risk, Classification, and Prognosis in Golden Retrievers. AKC Canine Health Foundation. 6/2013-6/2016. \$385,086.
- Ehrhart E (Co-Invest).** Survivin' Inhibition with EXN-3042 for Canine Lymphoma Therapy – Morris Animal Foundation. 6/2013-6/2015. \$106,911.
- Han S (PI).** Pathology of Zoo Animals. Denver Zoological Foundation. 1/1/14-12/31/14. \$33,325.
- Hyatt D (Co-I).** *E. coli* O157 Super-shedding in Colorado Dairies. CSU College Research Council. 7/1/13-6/30/14. \$25,000.
- Hyatt D (Co-Invest).** *E. coli* O157 Shedding and Antimicrobial Susceptibility in Colorado Dairies. HICAHS Pilot Project. 11/1/13-9/14/14. \$25,000.
- Hyatt D (Co-Invest).** *E. coli* O157 Shedding and Super Shedding on Colorado Dairies. CSU Supercluster Seed Grants. 7/1/13-6/30/14. \$26,346.
- Krafsur GM (PI) and Spraker TS (Co-Invest).** Histopathology and Selective Immunohistochemistry Analysis of Tissues Collected from Arctic Marine Mammals. North Slope Borough of Alaska. 1/1/12-6/30/15. \$52,088.
- Mason G (Co-Invest).** An Evaluation of the Suitability of Porcine Lung Tissue for Human Consumption. National Pork Board. 12/15/13-12/14/14. \$79,786.
- Pabilonia KL (PI).** Avian Health Cooperative Agreement 2014-2015. USDA/APHIS. 4/1/14-3/31/15. \$299,329.
- Pabilonia KL (PI).** Avian Health Program 2013-14. USDA/APHIS. 4/1/13-3/31/14. \$254,375.
- Pabilonia KL (PI).** Long-Term Antibody Persistence to Avian Influenza Virus in Mallards. USDA/APHIS. 9/15/13-9/14/14. \$4,400.
- Pabilonia KL (PI).** Avian Influenza Virus Isolation and Sequencing Agreement. USDA/APHIS through WSU. 9/24/12-9/23/14. \$8,872.

## **ONGOING FUNDED CONTRACTS AND GRANTS 2014-continued:**

**Pabilonia KL (PI).** Chicken Experimental Challenge Study with LPAI Virus. Life Technologies Corp. 11/18/13-11/17/14. \$50,991.

**Pabilonia KL (PI) and Powers B (Co-PI).** CSU VDL Participation in the Vet LIRN. HHS-FDA. 9/1/12-8/31/17. \$49,500.

**Pabilonia KL (PI).** Leptospirosis Testing: A Cooperative Agreement. USDA/APHIS. 5/14/12-5/13/14. \$105,935.

**Pabilonia KL (PI).** National Avian Influenza Tissue Archive and Genotyping. USDA/APHIS. 5/1/12-4/30/14. \$247,399.

**Pabilonia KL (PI).** National Wildlife Disease Tissue. USDA/APHIS Animal Plant Health Inspection. 9/27/13-9/26/15. \$150,000.

**Pabilonia KL (PI).** Using Conservation Genetics to Improve Ex Situ Management of the Critical Endangered Buffon Macaw. Association of Avian Veterinarians. 7/1/12-6/30/13. \$3,892.

**Pabilonia KL (PI) and Hyatt D (Co-Invest).** Evaluation of Salmonella Shedding From Symptomatic and Asymptomatic Pets. FDA. 9/16/11-9/15/14. \$108,387.

**Powers B (PI).** Classical Swine Fever Surveillance. USDA/APHIS. 4/5/12-3/31/14. \$45,595.

**Powers B (PI).** Swine Fever Surveillance Co-op Agreement. USDA. 8/1/13-12/31/14. \$46,750.

**Powers B (PI) and Pabilonia KL (Co-Invest).** National Animal Health Laboratory Network—Core Animal Diagnostic Laboratory. USDA/NIFA. 8/15/13-8/14/14. \$182,000.

**Powers B (PI) and Pabilonia KL (Co-Invest).** National Animal Health Laboratory Network—Core Animal Diagnostic Laboratory. USDA/NIFA. 8/15/14-8/14/15. \$202,000.

**Powers B (PI) and Pabilonia KL (Co-Invest).** USDA Equine Enhanced Passive Surveillance Pilot Project – Laboratory Connectivity. USDA/APHIS. 6/6/13-6/5/14. \$14,532.

**Powers B (PI) and Pabilonia KL (Co-Invest).** USDA Equine Enhanced Passive Surveillance Pilot Project – Laboratory Connectivity. USDA/APHIS. 6/6/14-6/5/15. \$14,625.

**Spraker TR (PI).** Epidemiology of Rabies in Northern Colorado. USDA/APHIS. 9/1/13-8/31/15. \$77,000.

**Spraker TR (PI).** Technical Assistance for Veterinary Pathology and Diagnostic Service for NPS Wildlife Species. National Park Service. 9/1/11-12/31/14. \$288,000.

**Spraker TR (PI) and Duncan CG (Co-Invest).** Technical Assistance for National Park Service Co-op Agreement. National Park Service. 9/1/13-12/31/14. \$218,000.

**Spraker TR (PI).** Technical Assistance to the National Park Service Wildlife Health Team. National Park Service. 8/31/09-7/31/14. \$940,700.

**Spraker TR (PI).** Wildlife Disease Outbreak Investigation. National Park Service. 6/15/14-12/31/15. \$148,500.

## STATE OR NATIONAL COMMITTEES - 2014

Aboellail T, Ballweber LR, Cole PC, Duncan C, Hamar D, Han S, Hyatt D, Kitchen D, Mason G, Mayo C, Niles G, Pabilonia K, Powers BE, Spraker TR, Van Campen H. *Members, American Association of Veterinary Laboratory Diagnosticians*

Aboellail T, Ballweber LR, Cole PC, Duncan C, Ehrhart EJ, Han S, Mason G, Niles G, Pabilonia K, Powers BE, Kitchen D, Spraker T, Van Campen H. *Members, Colorado Veterinary Medical Association*

Aboellail T, Cole PC, Duncan C, Ehrhart EJ, Frank C, Han S, Kitchen D, Mason G, Powers BE, Schaffer P, Spraker TR. *Members, American College of Veterinary Pathologists*

Cole PC, Pabilonia K, Powers B. *Members, American Veterinary Medical Association*

Ballweber LR. Co-Chair, Parasitology Committee, American Association of Veterinary Laboratory Diagnosticians

Ballweber LR. Board of Governors, American College of Veterinary Microbiologists

Ballweber LR. Member, European Veterinary Parasitology College

Ballweber LR. Member, World Association for the Advancement of Veterinary Parasitology

Ballweber LR. National Board of Veterinary Medical Examiners

Ballweber LR. Chair, Outreach/Research Committee, American Association of Veterinary Parasitologists

Duncan CD. Member, Publications Committee, American Association of Veterinary Laboratory Diagnosticians

Ehrhart EJ. Member, American College of Veterinary Pathologists Oncology Initiative

Ehrhart EJ. Member, American College of Veterinary Pathologists Training Committee

Hyatt D. Auditor, Accreditation Committee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Co-Chair, Bacteriology Steering Committee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, American Society of Microbiology

Hyatt D. Member, Antimicrobial Susceptibility Subcommittee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, Bacteriology Committee and Anaerobic Bacteriology Subcommittee. American Association of Veterinary Laboratory Diagnosticians

Hyatt D. Member, Colorado Laboratory Forum

Hyatt D. Member, International Association for Food Protection

Niles G. Member, National Animal Health Laboratory Network Coordinating Council

Pabilonia KL. Member, Accreditation Committee. American Association of Veterinary Laboratory Diagnosticians

Pabilonia KL. Chair, Publications Committee, American Association of Veterinary Laboratory Diagnosticians

Pabilonia KL. Coordinator, Colorado Avian Disease Surveillance Program

Pabilonia KL. Coordinator, Colorado State Agency for the National Poultry Improvement Plan

Pabilonia KL. Member, AAVLD/USAHA Joint Special Committee on the National Animal Health Laboratory Network

Pabilonia KL. Member, American College of Veterinary Microbiologists

Pabilonia KL. Member, Colorado Egg Producers

Pabilonia KL. Member, Conference Planning Committee. Colorado Veterinary Medical Association

Pabilonia KL. Member, United States Animal Health Association, Transmissible Diseases of Poultry Committee

Pabilonia KL. Member, USDA Live Bird Marketing System Working Group

**STATE OR NATIONAL COMMITTEES-continued:**

Powers BE. Chair, Committee on Advocacy and Outreach, Colorado Veterinary Medical Association  
Powers BE. Co-Chair, AAVLD/USAHA Joint Special Committee on the National Animal Health Laboratory Network  
Powers BE. Co-Chair, Government Relations Committee, American Association of Veterinary Laboratory Diagnosticians  
Powers BE. Member, American Veterinary Medical Association  
Powers BE. Member, Animal Health and Welfare Committee, Colorado Cattlemen's Association  
Powers BE. Member, Board of Directors, Colorado Veterinary Medical Association  
Powers BE. Member, Colorado Livestock Association  
Powers BE. Member, Financial Advisory Committee, American Association of Veterinary Laboratory Diagnosticians  
Powers BE. Member, Foundation Committee American Association of Veterinary Laboratory Diagnosticians  
Powers BE. Member, Government Coordinating Council, USDA/FDA/DHS  
Powers BE. Member, National Animal Health Information Technology Board, USDA

Spraker TR. Member, Wildlife Disease Association

Van Campen H. Editorial Board, American Association of Veterinary Laboratory Diagnosticians  
Van Campen H. Member, American College of Veterinary Microbiologists  
Van Campen H. Member, American Society of Microbiology  
Van Campen H. Member, American Society of Virology  
Van Campen H. Member, American Veterinary Medical Association  
Van Campen H. Member, Colorado Chapter of the Wildlife Society  
Van Campen H. Member, Committee on Education, Colorado Veterinary Medical Association  
Van Campen H. Member, Rocky Mountain Branch of the American Society for Microbiology  
Van Campen H. Southwest Representative, Executive Board, American Association of Veterinary Laboratory Diagnosticians

## ONGOING DIAGNOSTIC LABORATORY INVESTIGATIONS

Below is a list of disease surveillance and investigation projects that the Diagnostic Laboratory personnel are conducting. Many projects serve teaching and research functions, as well as outreach and service. Those with student involvement are indicated by PVM, MS, PhD. It is worth noting that many projects involve research that would be either very expensive or impossible to do under laboratory conditions. The collaboration with producers or other government agencies usually involves a large “in-kind” contribution of animal procurement, care, and facilities costs. The list excludes simple investigations directed at making a field diagnosis.

### *Livestock and Poultry*

- Race horse catastrophic bone failure
- Trichomonas beef-herd investigations
- Anthelmintic resistance in cattle
- Respiratory disease in llamas/alpacas
- Digital photography to aid in diagnosis during bovine field necropsies
- Antimicrobial susceptibility patterns of *E. coli* and *Salmonella* in domestic animals
- Johne’s disease diagnosis and immunopathogenesis of cattle
- Teaching hospital nosocomial infections
- *Salmonella* in commercial and backyard poultry flocks (PVM)
- Avian influenza in the U.S. and Asia (PVM)
- Syndrome surveillance in equine and cattle

### *Small Animals*

- MRSA investigations and documentation
- Canine liver disease
- Multiple oncology projects with many VTH and extramural clinicians and students (PhD)

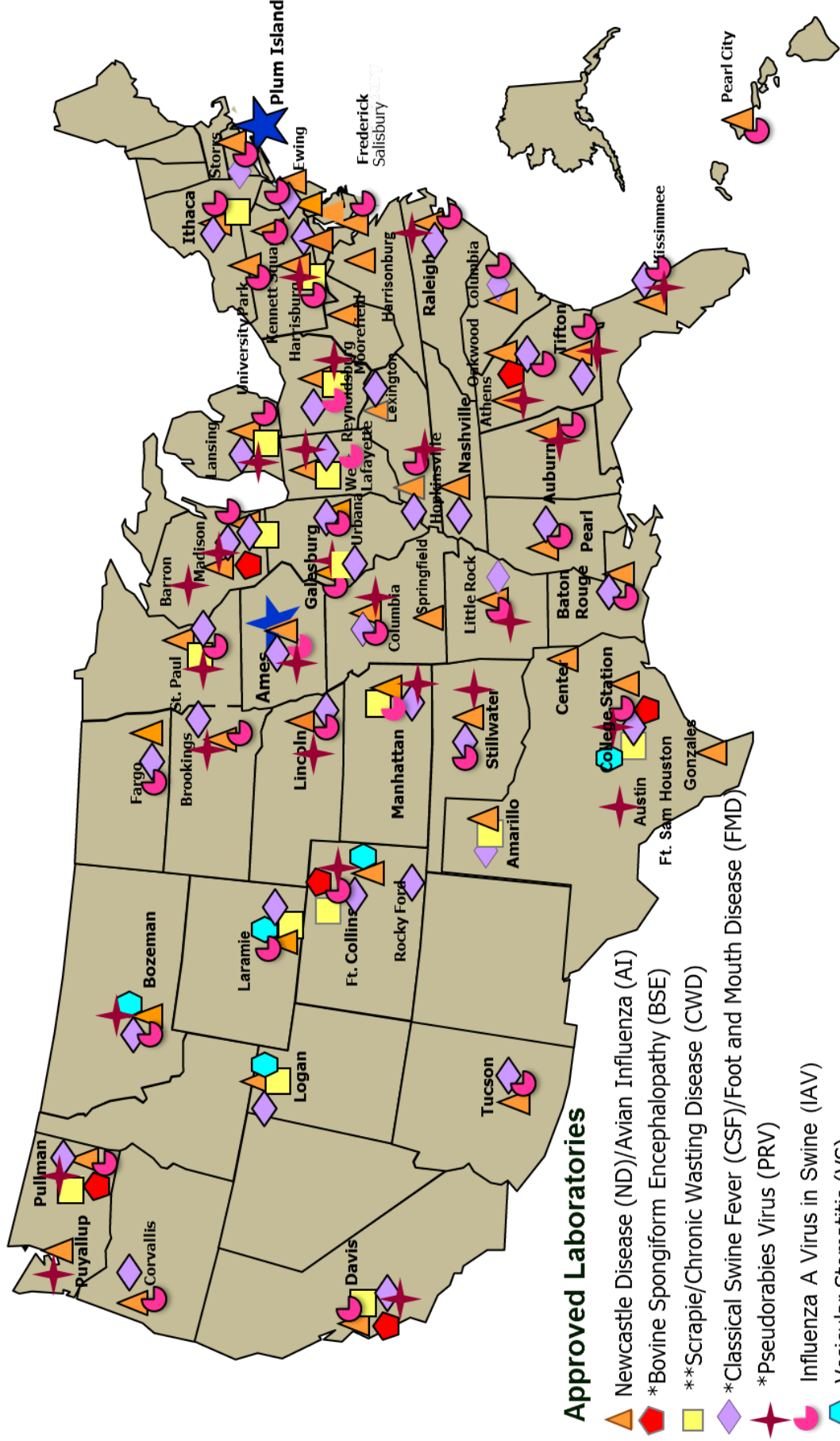
### *Wildlife and Epidemiology*

- Patterns and causes of skin cancer in sea turtles
- Epidemiology of Echinococcus in canids and cervids
- *Baylisascaris procyonis* and other zoonotic diseases in raccoons
- Marine mammal mortalities
- Wildlife disease surveillance: the role of diagnostic laboratories
- Exotic Newcastle disease and avian influenza surveillance in wild birds
- Isolation and characterization of avian influenza viruses from wild birds
- Prevalence and epidemiology of avian influenza viruses in domestic duck populations in Indonesia
- Exotic/Zoo pathology
- Transmissible Spongiform Encephalopathy
  - Chronic wasting disease of deer and elk surveillance
  - Chronic wasting disease of deer and elk pathogenesis (MS/PhD)
  - Bovine (BSE) surveillance: USDA reporting
  - Scrapie surveillance: USDA reporting

## 2013 PROFICIENCY TESTS COMPLETED

Disease	Test	Section	Administering Agency
Avian Influenza Virus	AGID	Fort Collins Avian Diagnostics	NVSL/NPIP
Avian Influenza Virus - Matrix, H5, H7	Real-time RT-PCR	Fort Collins BSL3	NVSL
Avian Paramyxovirus-1, vNDV	Real-time RT-PCR	Fort Collins BSL3	NVSL
Bovine Leukosis Virus	AGID	Fort Collins Virology	NVSL
Bovine Leukosis Virus	AGID	Rocky Ford	NVSL
Bovine Spongiform Encephalopathy	ELISA	Fort Collins TSE	NVSL
Bluetongue Virus	AGID	Fort Collins Virology	NVSL
Bluetongue Virus	AGID	Rocky Ford	NVSL
Brucellosis	Card Test	Fort Collins Bacteriology	CO Dept of Ag
Brucellosis	Card Test	Rocky Ford	CO Dept of Ag
Contagious Bovine Pleuropneumonia	Real-time PCR	Fort Collins BSL3	FADDL
Contagious Equine Metritis	Culture	Fort Collins Bacteriology	NVSL
Classical Swine Fever Virus	Real-time RT-PCR	Fort Collins BSL3	FADDL
Equine Infectious Anemia	AGID	Fort Collins Virology	NVSL
Equine Infectious Anemia	AGID	Rocky Ford	NVSL
Equine Infectious Anemia	AGID	Western Slope (Grand Junction)	NVSL
Foot-and-Mouth Disease Virus	Real-time RT-PCR	Fort Collins BSL3	FADDL
Johne's ( <i>M. avian</i> paraTB)	Direct PCR from feces	Fort Collins Bacteriology	NVSL
Johne's ( <i>M. avian</i> paraTB)	Direct PCR from feces	Rocky Ford	NVSL
Johne's ( <i>M. avian</i> paraTB)	ELISA	Fort Collins Bacteriology	NVSL
Johne's ( <i>M. avian</i> paraTB)	ELISA	Rocky Ford	NVSL
Johne's ( <i>M. avian</i> paraTB)	Solid Media	Fort Collins Bacteriology	NVSL
Johne's ( <i>M. avian</i> paraTB)	TREK	Fort Collins Bacteriology	NVSL
Lead (Blood)	Graphite Furnace Atomic Absorption Spectrophotometry	Fort Collins Chemistry/Toxicology	Wisconsin State Laboratory of Hygiene
Lumpy Skin Disease Virus	Real-time PCR	Fort Collins BSL3	FADDL
Piroplasmosis	cELISA	Fort Collins BSL3	NVSL
Pseudorabies Virus	ELISA	Fort Collins BSL3	NVSL
Quantitative Coliforms	IDEXX Colilert	Rocky Ford	NSI
<i>Salmonella</i> Group D	Culture/PCR	Fort Collins Bacteriology/Molecular	NVSL/NPIP
<i>Salmonella</i> spp. (dog feces)	Culture/PCR	Bacteriology/Molecular	Vet LIRN
Scrapie	Immunohistochemistry	Fort Collins TSE	NVSL
Swine Influenza Virus H1N1	Real-Time RT-PCR	Fort Collins BSL3	NVSL
Vesicular Stomatitis Virus	Complement Fixation	Fort Collins BSL3	NVSL

# National Animal Health Laboratory Network (NAHLN)



## Approved Laboratories

- Newcastle Disease (ND)/Avian Influenza (AI)
- \*Bovine Spongiform Encephalopathy (BSE)
- \*\*Scrapie/Chronic Wasting Disease (CWD)
- \*Classical Swine Fever (CSF)/Foot and Mouth Disease (FMD)
- \*Pseudorabies Virus (PRV)
- Influenza A Virus in Swine (IAV)
- Vesicular Stomatitis (VS)
- National Veterinary Services Laboratories

**COLORADO STATE UNIVERSITY  
VETERINARY DIAGNOSTIC LABORATORIES  
2013-14 ACCESSION STATISTICS**

**FORT COLLINS**

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Accessions</b>	91,843	89,289	89,176	86,202	108,938	100,624	111,123
<b>Animals</b>		161,449	NA	NA	158,759	151,372	161,213
<b>Tests Performed</b>	380,808	374,314	391,040	330,372	339,123	314,507	319,930

**BY SECTION**

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Administrative</b>	3,182	4,333	7,634	7,386	45,903	44,838	46,148
<b>Avian</b>	6,738	7,245	6,911	6,140	6,234	5,067	6,935
<b>Bacteriology</b>	47,014	52,946	60,637	29,138	19,464	19,169	17,368
<b>Bacti-Serology</b>	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	6,527	10,591	10,671
<b>BSL3</b>	3,864	1,862	2,819	3,990	10,698	445	-
<b>Chemistry</b>	4,840	4,883	4,863	4,919	8,515	7,984	7,849
<b>Clinical Path</b>	8,610	7,997	7,822	8,244	9,314	9,392	9,106
<b>Endocrinology</b>	2,967	2,783	2,948	2,680	3,218	2,843	2,762
<b>Food Safety</b>	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	1,246	2,284	2,699
<b>Histology</b>	177,361	171,743	165,130	155,159	85,900	76,570	75,210
<b>M. Diagnostics</b>	22,354	5,943	4,268	4,088	2,555	3,398	3,571
<b>Necropsy</b>	1,781	1,870	1,686	1,762	1,678	1,543	1,609
<b>Pathology</b>	33,143	33,114	33,414	32,001	37,527	35,746	38,149
<b>Parasitology</b>	8,616	8,138	8,050	8,435	6,524	7,876	7,289
<b>Special Sero</b>	8,388	8,067	8,052	9,026	14,441	13,989	14,853
<b>TSE</b>	23,278	31,627	32,259	20,192	33,976	25,078	30,440
<b>Virology</b>	28,672	31,763	44,547	37,212	4,286	4,328	5,140
<b>Viro Serology</b>	Combined w/ virology	Combined w/ virology	Combined w/ virology	Combined w/ virology	40,732	43,366	39,209

The Fort Collins Laboratory had an increase in accessions (2.9%) and an increase in number of tests (1.7%). There were increases in BSL3, histology, parasitology, molecular diagnostics, and clinical pathology while bacteriology, virology, TSE, and administration (send-outs and media) decreased. The other sections had minor increases or decreases.



## ROCKY FORD

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Accessions</b>	9,118	9,922	11,281	12,948	13,808	13,248	13,461
<b>Animals</b>		76,358	NA	NA	82,909	111,150	102,111
<b>Tests Performed</b>	<b>133,387</b>	<b>195,954</b>	<b>170,404</b>	<b>107,971</b>	<b>92,219</b>	<b>122,581</b>	<b>112,542</b>

### *BY SECTION*

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Administrative</b>	21,639	22,507	20,512	15,504	3,634	4,024	4,363
<b>Bacteriology</b>	10,991	38,253	8,334	3,213	1,731	1,483	1,438
<b>Bacti-Serology</b>	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	630	762	2,199
<b>Chemistry</b>	686	892	634	560	895	740	817
<b>Clin Path</b>	386	368	474	585	746	738	805
<b>Endocrinology</b>	118	205	185	146	242	251	346
<b>Pathology</b>	263	288	220	593	356	423	479
<b>Parasitology</b>	16,274	17,636	19,858	17,006	16,839	19,635	19,227
<b>Virology</b>	83,030	115,805	120,187	70,348	57,475	78,403	73,470
<b>Viro-Serology</b>	Combined w/ virology	Combined w/ virology	Combined w/ virology	Combined w/ virology	9,670	16,054	9,368

The Rocky Ford Laboratory had a decrease in accessions (-8.1%) and a decrease in the number of tests performed (31.9%). The largest decrease was in bacteriology and virology due to decreased export testing.

## WESTERN SLOPE

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Accessions</b>	2,726	2,710	2,847	3,195	3,608	3,528	3,799
<b>Animals</b>		16,528	NA	NA	20,770	16,879	16,366
<b>Tests Performed</b>	<b>16,940</b>	<b>17,828</b>	<b>18,784</b>	<b>19,488</b>	<b>24,073</b>	<b>20,408</b>	<b>19,585</b>

## BY SECTION

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Administrative</b>	2,423	2,266	2,619	1,981	3,736	2,147	1,523
<b>Bacteriology</b>	8,998	10,791	11,181	11,288	1,448	1,292	1,410
<b>Bacti-Serology</b>	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	Combined w/ bacteriology	11,458	8,765	9,119
<b>Clinical Path</b>	19	14	52	109	138	104	4
<b>Pathology</b>	649	661	790	918	918	1,005	1,071
<b>Parasitology</b>	3,077	2,297	2,533	2,961	3,120	3,453	2,988
<b>Virology</b>	1,780	1,799	1,608	2,225	487	567	469
<b>Viro-Serology</b>	Combined w/ virology	Combined w/ virology	Combined w/ virology	Combined w/ virology	2,351	2,619	2,874

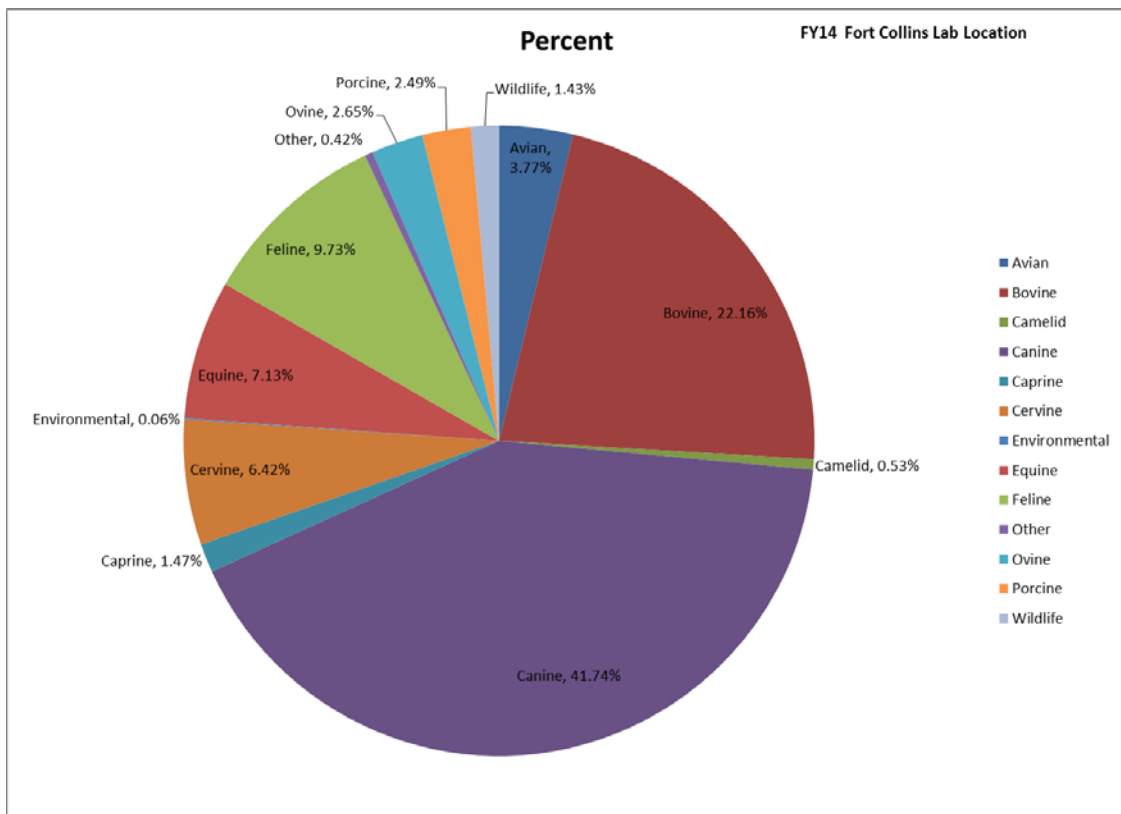
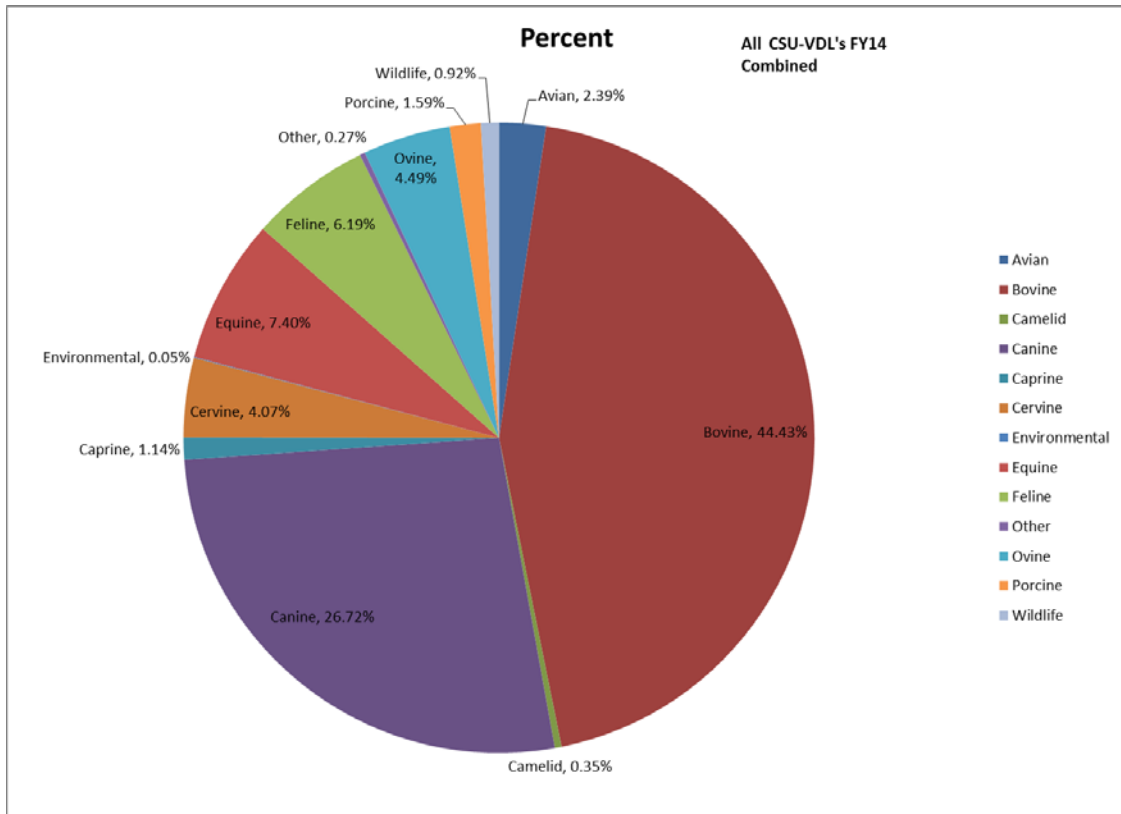
The Western Slope Laboratory had an increase in accessions (0.6%) and a decrease in the number of tests performed (-4.9%). There was a slight decrease in most sections except parasitology, which increased.

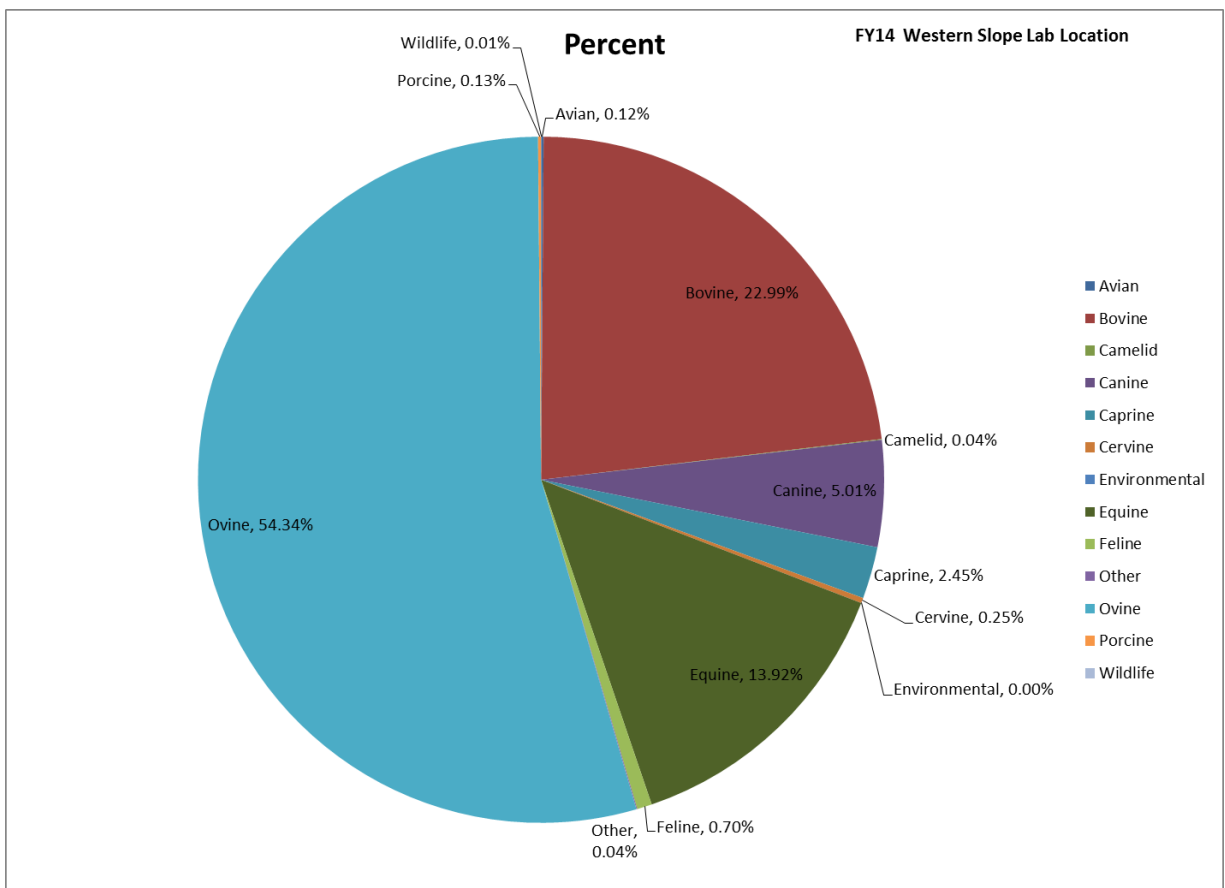
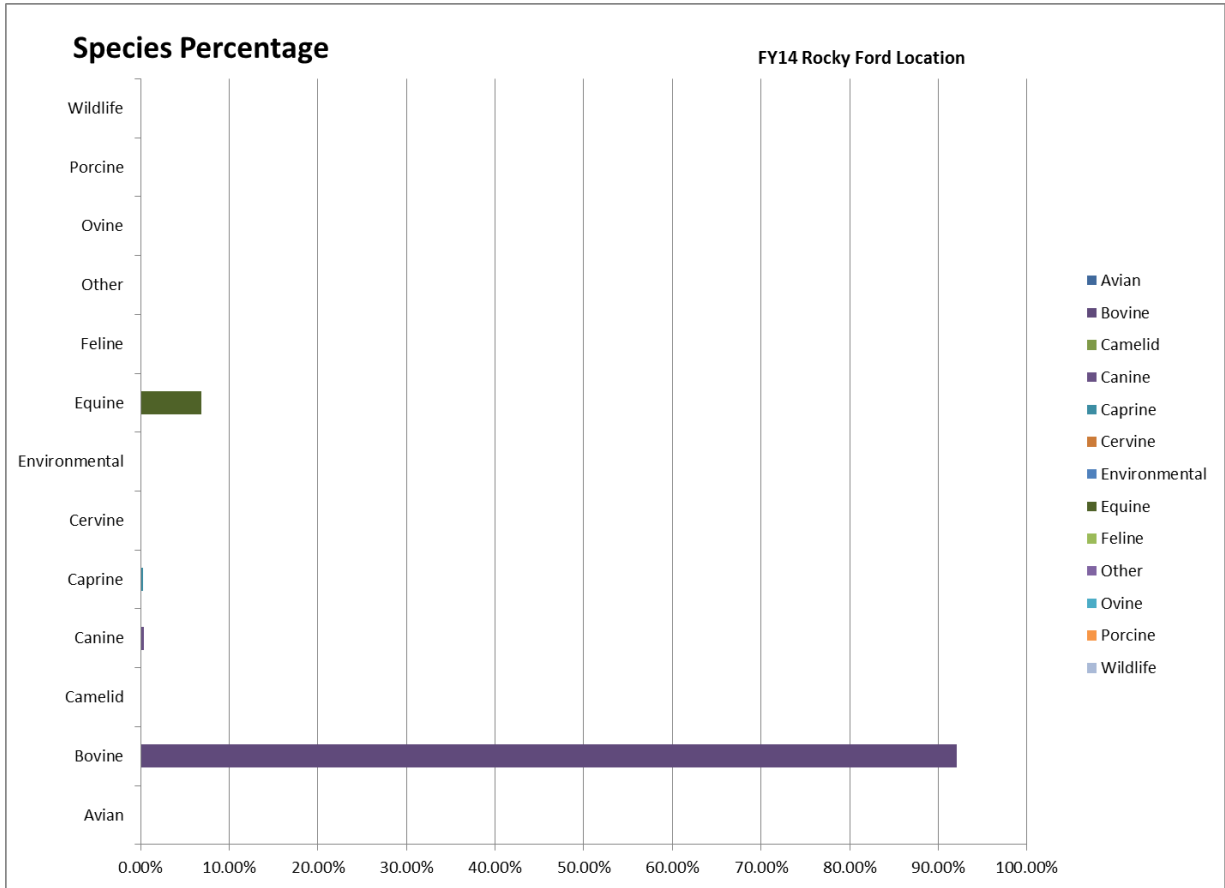
## ALL LABS

	13-14	12-13	11-12	10-11	09-10	08-09	07-08
<b>Accessions</b>	103,687	101,921	103,304	102,345	126,354	117,400	128,383
<b>Animals</b>		254,335	NA	NA	262,438	279,401	279,690
<b>Tests Performed</b>	531,141	588,096	580,228	457,831	455,415	457,976	452,057

All laboratories combined had an increase in number of accessions (1.7%), and a decrease in number of tests performed (-9.7%).

# FY14 Species by Test Graph





## PATHOLOGY

The table below indicates the number of necropsies performed for the listed species. The first column is cases derived from the Veterinary Teaching Hospital (VTH) and the second column is cases from the state or region. The next two columns are the totals for the last two fiscal years and the final column is the percent change from the fiscal year 13/14 compared to fiscal year 12/13. Cases from the VTH increased by 3 (0.3%), while cases from the state and region decreased by 120 (-12.4%).

### NECROPSY

Species	VTH 7/13-6/14	State/Region 7/13-6/14	TOTAL 7/13-6/14	TOTAL 7/12-6/13	% Change
Bovine	57	79	136	135	0.7
Equine	127	89	216	179	20.7
Porcine	5	3	8	11	-27.3
Ovine/Caprine	30	53	83	59	40.7
OLA*/OSA*	31	28	59	74	-20.3
Canine	429	282	711	781	-9.0
Feline	120	83	203	244	-16.8
Avian	33	143	176	167	5.4
Wildlife/ Exotics	68	87	155	214	-27.6
<b>TOTAL</b>	<b>900</b>	<b>847</b>	<b>1747</b>	<b>1864</b>	<b>-6.3</b>

\*OLA = Other Large Animal

\*OSA = Other Small Animal

+ 80 Canine/Feline/Equine Legal or Insurance Cases

### TRANSMISSIBLE SPONGIFORM ENCEPHALOPATHY TESTING

Test	# Tests 7/13-6/14	# Cases 7/13-6/14	# Cases Positive (%)	Number 7/12-6/13	% Change
Captive Elk Surveillance	1,304	1302	6 (0.5)	2,221	-41.3
CWD Surveillance+	1,550	951	144 (12.0)	2,220	-30.2
CWD—ELISA CO & Others*	8,166	8,166	95 (1.2)	6,525	25.1
USDA TSE (Scrapie)	4,268	252	0 (0.0)	12,733	-66.5
USDA BSE	7,990	7,990	0 (0.0)	7,928	0.8
<b>TOTAL</b>	<b>23,278</b>	<b>18,661</b>	<b>NA</b>	<b>31,627</b>	<b>-26.4</b>

\*1,658 Colorado only [95 (5.7%) positive]

+Includes rectal biopsies

The top table indicates the number of abortion screens for the listed species for the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 13/14 from fiscal year 12/13. The bottom table indicates the number of specific diagnoses or causative agents identified for abortions in fiscal year 13/14. The last column of the bottom table indicates the number and percentage of abortions with undetermined cause.

### ABORTION SCREENS

Species	Number 7/13-6/14	%	Number 7/12-6/13	% Change
<b>Bovine</b>	122	65.6	84	45.2
<b>Equine</b>	18	9.7	17	5.9
<b>Porcine</b>	3	1.6	2	50.0
<b>Ovine</b>	7	3.8	11	-36.4
<b>Caprine</b>	19	10.2	6	216.7
<b>Camelid</b>	3	1.6	10	-70.0
<b>Other</b>	14	7.5	7	100.0
<b>TOTAL</b>	<b>186</b>	<b>100.0</b>	<b>137</b>	<b>35.8</b>

Species	Number Examined	Viral (%)	Bacterial (%)	Other (%)	Undeter- mined(%)
<b>Bovine</b>	122	25 (20.5) <sup>a</sup>	25 (20.5) <sup>b</sup>	14 (11.5) <sup>c</sup>	62 (50.8)
<b>Equine</b>	18	0 (0.0)	6 (33.3)	1 (5.6) <sup>d</sup>	11 (61.1)
<b>Porcine</b>	3	0 (0.0)	0 (0.0)	0 (0.0)	3 (100.0)
<b>Ovine</b>	7	0 (0.0)	2 (28.6) <sup>e</sup>	1 (14.3) <sup>f</sup>	4 (57.1)
<b>Caprine</b>	19	0 (0.0)	4 (21.1) <sup>g</sup>	3 (15.8) <sup>h</sup>	12 (63.2)
<b>Camelid</b>	3	0 (0.0)	1 (33.3)	0 (0.0)	2 (66.7)
<b>TOTAL</b>	<b>172</b>	<b>25 (14.5)</b>	<b>38 (22.1)</b>	<b>19 (11.0)</b>	<b>94 (54.7)</b>

<sup>a</sup> 13 with IBR, 12 with BVD (2 both IBR and BVD)

<sup>b</sup> 1 Campylobacter, 5 Leptospirosis

<sup>c</sup> 10 Neospora, 2 congenital, 2 nitrate toxicity

<sup>d</sup> 1 fungal

<sup>e</sup> 1 Campylobacter

<sup>f</sup> 1 Chlamydia

<sup>g</sup> 1 Campylobacter

<sup>h</sup> 2 Chlamydia, 1 Coxiella

The top table indicates the number of diarrhea screens performed in the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 13/14 compared to fiscal year 12/13. The bottom table indicates the determined causes of the diarrhea over the number of times the agents were tested for, and the percentages of detection of the agent are given in parentheses. In many cases, more than one agent was detected.

### DIARRHEA SCREENS

Species	Number 7/13-6/14	%	Number 7/12-6/13	% Change
<b>Bovine</b>	101	56.1	156	-35.2
<b>Equine</b>	13	7.2	9	44.4
<b>Porcine</b>	3	1.7	1	200.0
<b>Ovine/Caprine</b>	5	2.8	5	0.0
<b>Canine</b>	15	8.3	28	-46.4
<b>Feline</b>	13	7.2	10	30.0
<b>Cervids</b>	17	9.4	1	1600.0
<b>Other</b>	13	7.2	8	62.5
<b>TOTAL</b>	<b>180</b>	<b>100.0</b>	<b>218</b>	<b>-17.4</b>

Species	Rota	Corona	E. coli	Salmonella	Clostridia	Cryptosporidia and/or Giardia	Other	Undeter- mined
<b>Bovine</b>	29/101 (28.7)	7/101 (6.9)	22/101 (21.8)	16/101 (15.8)	15/101 (14.9)	18/101 (17.8)	3/101 (3.0) <sup>a</sup>	11/101 (10.9)
<b>Equine</b>	0/13 (0.0)	0/13 (0.0)	0/13 (0.0)	4/13 (30.8)	0/13 (0.0)	0/13 (0.0)	2/13 <sup>b</sup> (15.4)	7/13 (53.8)
<b>Ovine/ Caprine</b>	0/5 (0.0)	0/5 (0.0)	1/5 (20.0)	0/5 (0.0)	0/5 (0.0)	0/5 (0.0)	2/5 <sup>c</sup> (40.0)	2/5 (40.0)
<b>Porcine</b>	0/3 (0.0)	0/3 (0.0)	1/3 (33.3)	1/3 (33.3)	0/3 (0.0)	0/3 (0.0)	1/3 <sup>d</sup> (33.3)	0/0 (0.0)
<b>Canine</b>	0/15 (0.0)	0/15 (0.0)	3/15 (20.0)	0/15 (0.0)	3/15 (20.0)	2/15 (13.3)	3/15 <sup>e</sup> (20.0)	4/15 (26.7)
<b>TOTAL</b>	<b>29/137 (21.2)</b>	<b>7/137 (5.1)</b>	<b>27/137 (19.7)</b>	<b>21/137 (15.3)</b>	<b>18/137 (13.1)</b>	<b>20/137 (14.6)</b>	<b>11/137 (8.0)</b>	<b>24/137 (17.5)</b>

<sup>a</sup> BVD (2), fungal abomasitis (1)

<sup>b</sup> Strongyles (2)

<sup>c</sup> Coccidia (2), strongyles (2)

<sup>d</sup> Lawsonia (1)

<sup>e</sup> Parvovirus (2), ascarids (1)

The first two columns of the top table indicate the number of biopsies performed for each of the listed species for the Veterinary Teaching Hospital (VTH) and the state or country. The last three columns indicate the total for the last two fiscal years and the percent change of fiscal year 13/14 compared to fiscal year 12/13. The VTH cases increased by 55 cases (4.0%) while the state/country cases increased by 860 cases (2.8%). The bottom table indicates the number and percentage of certain diagnoses given for both the VTH and state/country.

### BIOPSY

<b>SPECIES</b>	<b>VTH 7/13-6/14</b>	<b>State/Country 7/13-6/14</b>	<b>Total 7/13-6/14</b>	<b>Total 7/12-6/13</b>	<b>% Change</b>
<b>Canine</b>	1,234	25,495	26,729	26,030	2.7
<b>Feline</b>	116	3,943	4,059	3,924	3.4
<b>Other/Exotics</b>	9	659	668	586	14.0
<b>Avian</b>	7	102	109	80	36.3
<b>Equine</b>	70	519	589	607	-3.0
<b>Bovine</b>	3	237	240	264	-9.1
<b>Porcine</b>	1	12	13	7	85.7
<b>Ovine/Caprine</b>	3	62	65	58	12.1
<b>Camelid/Cervine</b>	3	57	60	61	-1.6
<b>TOTAL</b>	<b>1,446</b>	<b>31,086</b>	<b>32,532</b>	<b>31,617</b>	<b>2.9</b>

\*Of this total, 274 were 2<sup>nd</sup> opinion consultations from outside the laboratory, and 217 were dermatology-specific cases.

<b>Diagnosis</b>	<b>VTH (%)</b>	<b>State/Country (%)</b>	<b>TOTAL (%)</b>
<b>Benign Tumor</b>	354 (24.0)	9,739 (30.5)	10,093 (30.2)
<b>Sarcoma</b>	430 (29.1)	8,847 (27.7)	9,277 (27.8)*
<b>Carcinoma</b>	214 (14.5)	3,742 (11.7)	3,956 (11.8)
<b>Skin Disease</b>	176 (11.9)	2,873 (9.0)	3,049 (9.1)
<b>Liver Disease</b>	172 (11.6)	4,262 (13.4)	4,434 (13.3)
<b>GI Disease</b>	132 (8.9)	2,461 (7.7)	2,593 (7.8)

\*2,949 (31.8%) of these were mast cell tumors. There were 437 mast cell tumor profiles and 924 c-Kit mutation PCRs.

- There were 204 biopsies referred from the Rocky Ford Branch Laboratory in fiscal year 13/14 compared to 240 in fiscal year 12/13. These were mostly canine, feline, or equine.



## UTERINE BIOPSIES

The top table indicates the number of uterine biopsies for the last two fiscal years, and the percent change of fiscal year 13/14 compared to fiscal year 12/13. The bottom table indicates the distribution and percentages of the different grades given to the uterine biopsies.

Species	Number 7/13-6/14	%	Number 7/12-6/13	% Change
Equine	611	100.0	612	-0.2
Other	0	0.0	0	0.0
<b>TOTAL</b>	<b>611</b>	<b>100.0</b>	<b>612</b>	<b>-0.2</b>

Grade	Number	%
1A	162	26.5
1B	218	35.7
2A	103	16.9
2B	101	16.5
3A	23	3.8
3B	1	0.2
NA/Unknown	3	0.5

## HISTOLOGY

The table below lists the number of slides, special stains and immunohistochemical (IHC) stains performed by the Histology Laboratory (not including Scrapie or CWD).

Procedure	Number 7/13-6/14	%	Number 7/12-6/13	% Change
H&E Slides/Biopsy & Necropsy	159,792	90.1	155,315	2.9
H&E Slides/Research	12,720	7.2	12,269	3.7
Special Stains	3,697	2.1	2,887	28.1
IHC Stains		% of IHC		
Actin	8	0.7	18	-55.6
BVD	34	3.0	23	47.8
CD3/CD79a or PAX-5	452	39.2	475	-4.8
CD18	139	12.1	140	-0.7
c-Kit	55	4.8	76	-27.6
Chromogranin	25	2.2	26	-3.8
Cytokeratin	69	6.0	79	-12.7
Desmin	53	4.6	77	-31.2
DOG-1	39	3.4	56	-30.4
FIP	30	2.6	28	7.1
Factor VIII	40	3.5	76	-47.4
Leptospirosis	4	0.3	7	-42.9
Melan A	52	4.5	46	13.0
MUM-1	51	4.4	40	27.5
Synaptophysin	26	2.3	34	-23.5
Vimentin	57	4.9	56	1.8
Other	18	1.6	15	20.0
Subtotal IHC	1,152		1,272	-9.4
<b>TOTAL</b>	<b>177,361</b>	<b>100.0</b>	<b>171,743</b>	<b>3.3</b>

## BACTERIOLOGY

This table lists the different cultures and other selected tests performed by the bacteriology or molecular diagnostics sections. The total number of tests performed in fiscal year 13/14 is compared to the total number of tests performed in fiscal year 12/13. The last column is the percent change between the fiscal years.

Test	Number 7/13-6/14	Number Positive %	Number 7/12-6/13	% Change
Aerobic Culture	5,258	NA	5,118	2.7
Aerobic & Anaerobic Culture	1,574	NA	1,438	9.5
Fecal Culture	3,312	NA	3,234	2.4
Clostridial Fecal Culture	330	126 (38.2)	368	-10.3
PCR Clostridial Genotype	8	8 (100)	14	-42.9
Clostridial Perfringens/ Difficile Toxin	48	2 (4.2)	51	-5.9
PCR <i>E. coli</i> Multiplex	13	1 (7.7)	1	1200.0
Mycobacterial Culture/PCR	166	14 (8.4)	82	102.4
Blood Culture	108	NA	117	-7.7
Campylobacter Culture	398	2 (0.5)	341	16.7
Mycoplasma Culture	178	19 (10.7)	167	6.6
CEM Culture	69	0 (0.0)	164	-57.9
Strep equi PCR	168	11 (6.5)	131	28.2
Fungal Culture	442	86 (19.5)	402	10.0
PCR Leptospirosis	253	8 (3.2)	256	-1.2
Antimicrobial Susceptibility	6,010	NA	5,474	9.8
Environmental Culture (Swiffer)	1,084	18 (1.7)	1,602	-32.3
PFGE	0	NA	220	-100.0
MRSA Culture	173	8 (4.6)	57	203.5
Biolog Bacti ID	4	NA	21	-81.0
Acid-fast or Gram stain	199	NA	NA	NA
<b>TOTAL</b>	<b>19,795</b>	<b>NA</b>	<b>19,258</b>	<b>2.8</b>

\*7 type A, 1 type C, 0 type E

The table below lists a breakdown of selected culture tests by species.

SPECIES	Aerobic Culture	Aerobic/Anaerobic Culture	Fecal Culture	Clostridial Fecal Culture	Mycoplasma Culture	Fungal Culture	TOTAL 7/13-6/14	%
<b>Bovine</b>	357	56	429	133	33	0	1,008	9.1
<b>Equine</b>	765	160	2,253	63	0	41	3,282	29.6
<b>Porcine</b>	38	0	13	4	0	0	55	0.5
<b>Ovine/ Caprine</b>	155	30	153	15	4	1	358	3.2
<b>Camelid</b>	19	16	128	1	0	2	166	1.5
<b>Canine</b>	2,818	1,106	199	41	100	219	4,483	40.4
<b>Feline</b>	811	147	40	17	20	138	1,173	10.6
<b>Avian</b>	32	10	20	4	1	2	69	0.6
<b>Cervine</b>	4	0	17	17	0	0	38	0.3
<b>Non-Animal</b>	14	5	0	1	0	6	26	0.2
<b>Other</b>	245	44	60	34	20	33	436	3.9
<b>TOTAL</b>	<b>5,258</b>	<b>1,574</b>	<b>3,312</b>	<b>330</b>	<b>178</b>	<b>442</b>	<b>11,094</b>	<b>100.0</b>

The table below lists the serology tests performed in the bacteriology section with the number of tests performed in fiscal year 13/14 compared to the number of tests performed in fiscal year 12/13. The last column is the percent change between the fiscal years. In the middle column are selected results for some of the serologic tests.

TEST	Number 7/13-6/14	Positive (%)	Number 7/12-6/13	% Change
<b>Mycobacterium paratuberculosis (ELISA)</b>	3,200	Suspect-4 (0.1) Positive-113 (3.5) Strongly Positive-50 (1.6)	18,075	-82.3
<b>M. paratuberculosis AGID</b>	287	6	300	-4.3
<b>Brucella abortus</b>	239	0 (0.0)	280	-14.6
<b>Brucella canis</b>	131	7 (5.3)	197	-33.5
<b>Leptospirosis (5 serovars)</b>	3,612 x 5=18,060 <sup>a</sup>	3,418 (18.9)	2,344 x 5=11,720	54.1
<b>Lepto bratislava</b>	3,099	1,118 (36.1)	1,697	82.6
<b>Aspergillosis</b>	77	2 (2.6)	85	-9.4
<b>Blastomycosis</b>	76	0 (0.0)	77	-1.3
<b>Coccidioidomycosis</b>	114	16 (14.0)	112	1.8
<b>Histoplasmosis</b>	70	0 (0.0)	77	-9.1
<b>Cryptococcus</b>	232	16 (6.9)	173	34.1
<b>IgG Estimate</b>	15	NA(-)	24	-37.5
<b>IgG Quantitation</b>	139	NA(-)	166	-16.3
<b>IgA &amp; IgM Quantitation</b>	194	NA(-)	234	-17.1
<b>Protein Electrophoresis</b>	120	NA(-)	87	37.9
<b>Immunofixation</b>	35	NA(-)	20	75.0
<b>ANA Titer</b>	18	4 (22.2)	22	-18.2
<b>TOTAL</b>	<b>26,106</b>	<b>--</b>	<b>33,346</b>	<b>-21.7</b>

<sup>a</sup> 479 (32.7%) bovine, 1 (0.9%) camelids, 70 (6.6%) canine, 7 (28.0%) equine, 0 (0.0%) feline, 4 (26.7%) other, and 2,857 (18.6%) porcine had titers  $\geq$ 1:100.

The table below lists the food safety (including pregnancy tests) diagnostic testing for the last two fiscal years and the percent change between the two fiscal years.

Test Performed	Number 7/13-6/14	Number 7/12-6/13	% Change
Milk Culture	27	5	440.0
Bovine Pregnancy Test	65 <sup>a</sup>	131	-50.4
Milk Mycoplasma Culture/PCR	44 <sup>b</sup>	26	69.2
Milk Bacteria ID	745 <sup>c</sup>	174	328.2
Milk Bacteria ID & Mycoplasma Culture	77 <sup>d</sup>	NA	NA
Milk Bulk Tank Screen	40	NA	NA
Milk Somatic Cell Count	13	NA	NA
Milk Plate Count & Coliform Count	82	NA	NA
Milk Quality Test or Preliminary Incubation	13	NA	NA
Milk Beta-Lactam Residue	1	NA	NA
Aerobic Feed Culture	6	6	0.0
<b>TOTALS</b>	<b>1,113</b>	<b>342</b>	<b>225.4</b>

<sup>a</sup> 42 ( 95.5%) positive

<sup>b</sup> 8 (18.2%) positive

<sup>c</sup> 30 (4.0%) *Staphylococcus aureus* positive and 6 (0.8%) *Mycoplasma* positive

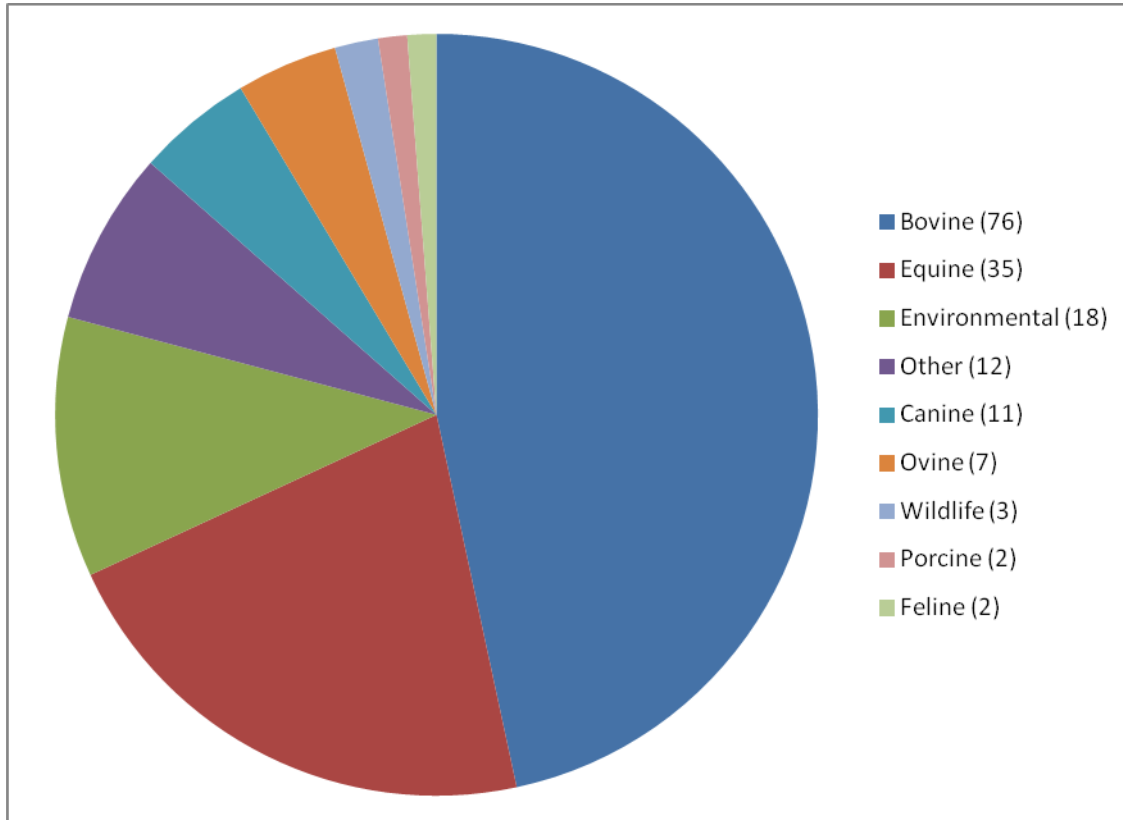
<sup>d</sup> 5 (6.5%) *Staphylococcus aureus* positive and 0 (0.0%) *Mycoplasma* positive

Leptospirosis serology results for each of the 5 serotypes for serological samples submitted between July 1, 2013 and June 30, 2014 for ALL animal species. A total of 3,612 serum samples were tested and the table below gives the highest titer for each serotype and the source species of the serum sample.

Serotype	Species	Titer
Canicola	Bovine	1:6400
Grippityphosa	Canine	1:6400
Hardjo	Canine	1:3200
Icterohaemorrhagiae	Canine	1:3200
Pomona	Bovine	1:6400

A total of 253 *Leptospira* PCR tests were performed between the dates of 07/01/13 – 06/30/14. The PCR was positive for DNA in 8 samples, 6 canines (5 from Fort Collins) and 2 bovine.

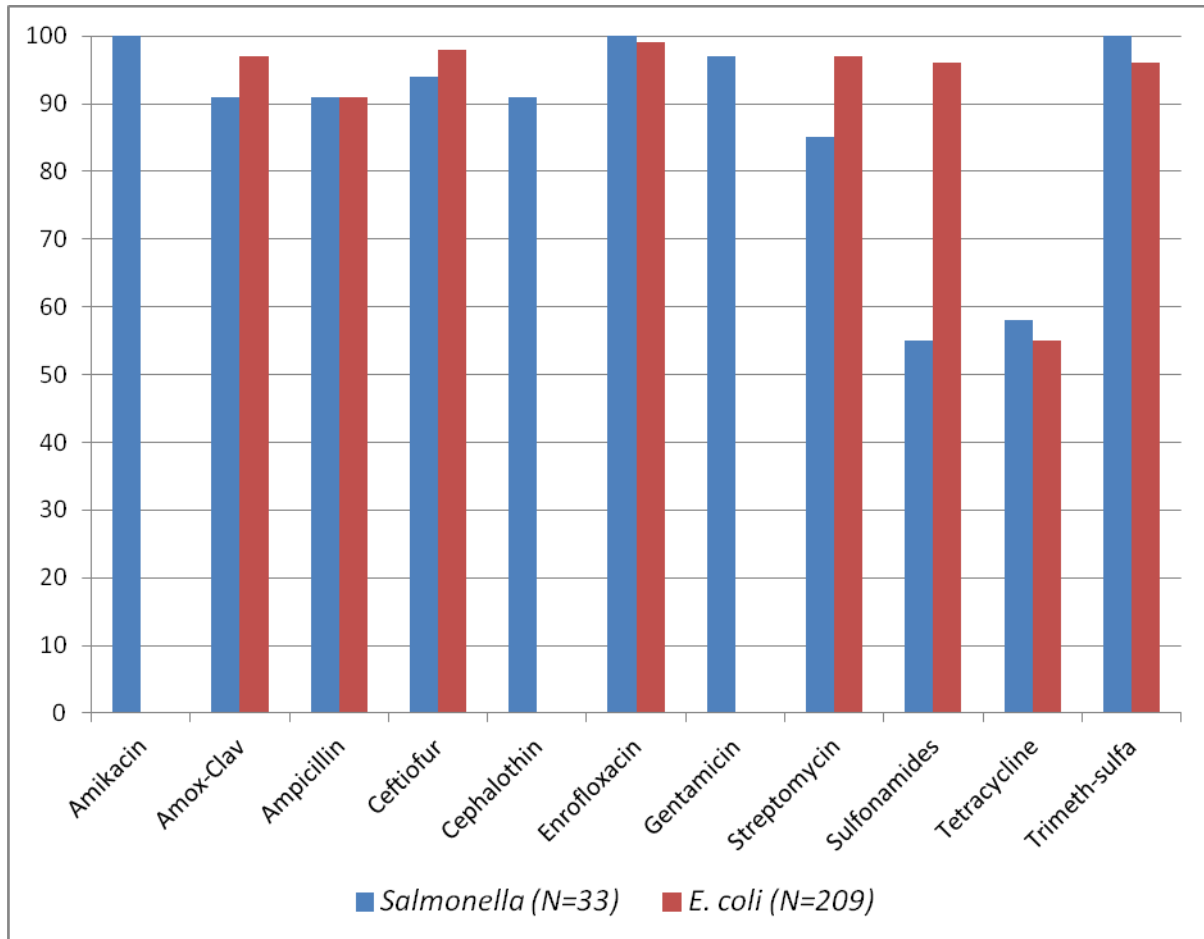
*Salmonella* Isolations by Animal Species – 07/01/13-06/30/14



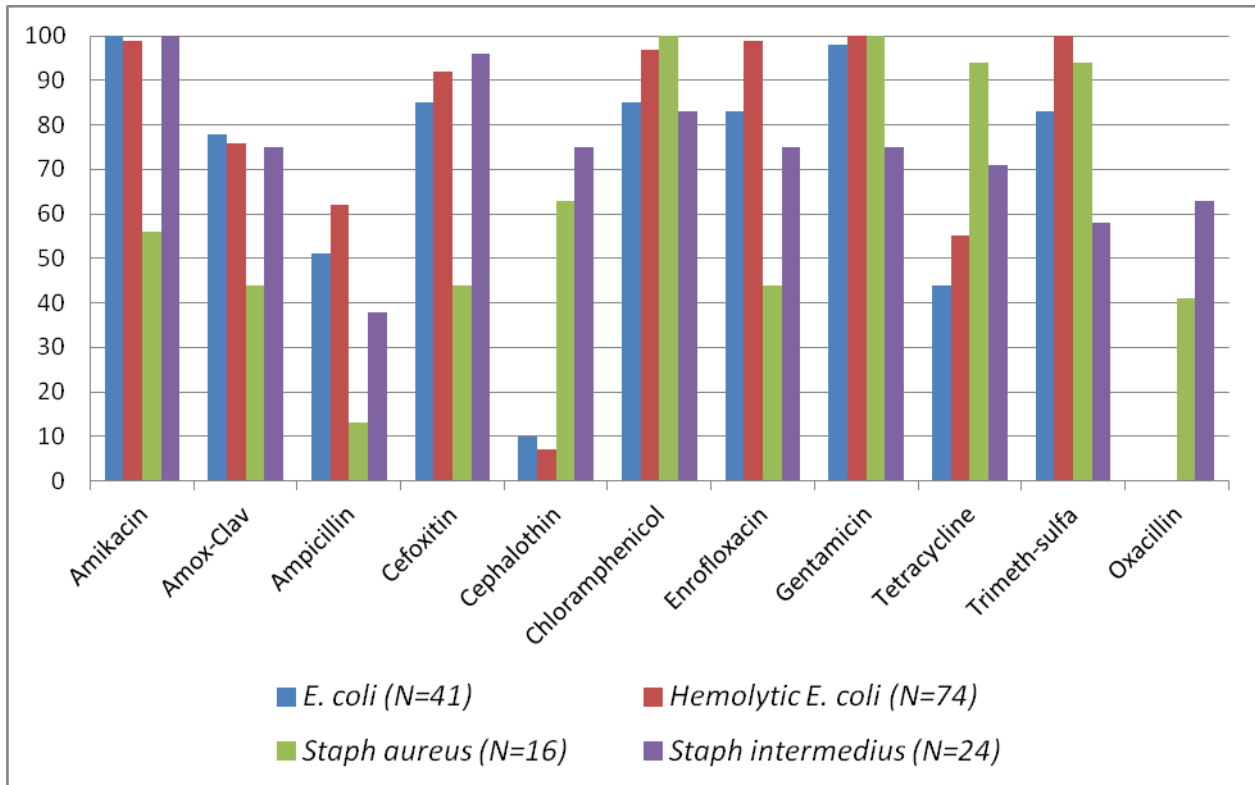
*Salmonella* serotypes at the CSU-VDL between July 1, 2013 and June 30, 2014 in order of number of isolations.

Dublin, Muenchen, Montevideo, Newport, Cerro, Typhimurium, Muenster, Typhimurium var 5-, Sent to NVSL, Senftenberg, Mbandaka, Havana, 4,12:i:-, 4,5,12:i:-, Agoueve, Anatum, Apapa, Barranquilla, Blockley, Blukwa, Cotham, Cubana, Denver, Enteritidis, Give\_var.\_15+, III\_21::l,v:z, III\_60:r:e,n,x,z15, Kentucky, Liverpool, Livingstone, Meleagridis, Oranienburg, Paratyphi\_B\_var.\_L - tartrate +, Rough\_0:z10:e,n,z15, Schwarzengrund, Weltevreden

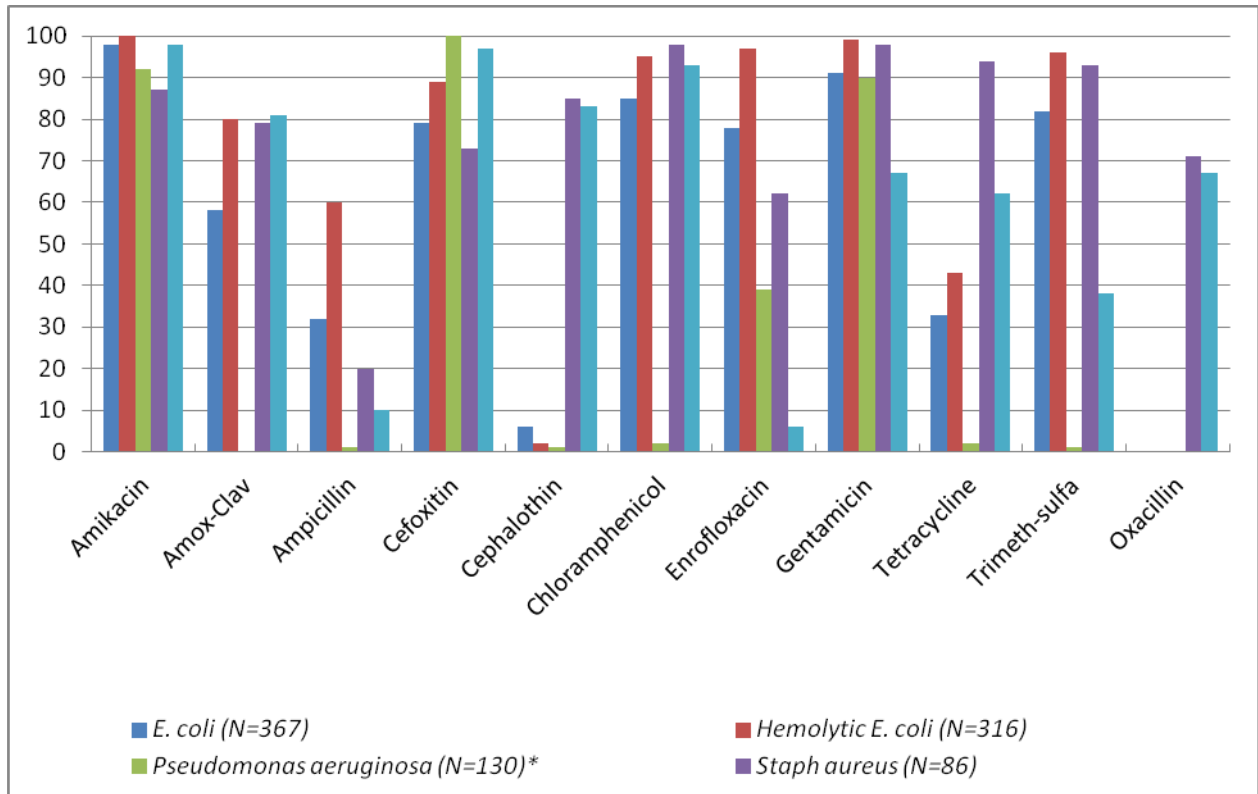
Percent of Susceptible Bovine Isolates From All Sample Types between 7/1/2013 – 6/30/2014.  
Drug not tested is shown as 0%.



Percent of Susceptible Feline Isolates From All Sample Types between 7/1/2013 – 6/30/2014.  
 Drug not tested is shown as 0%.



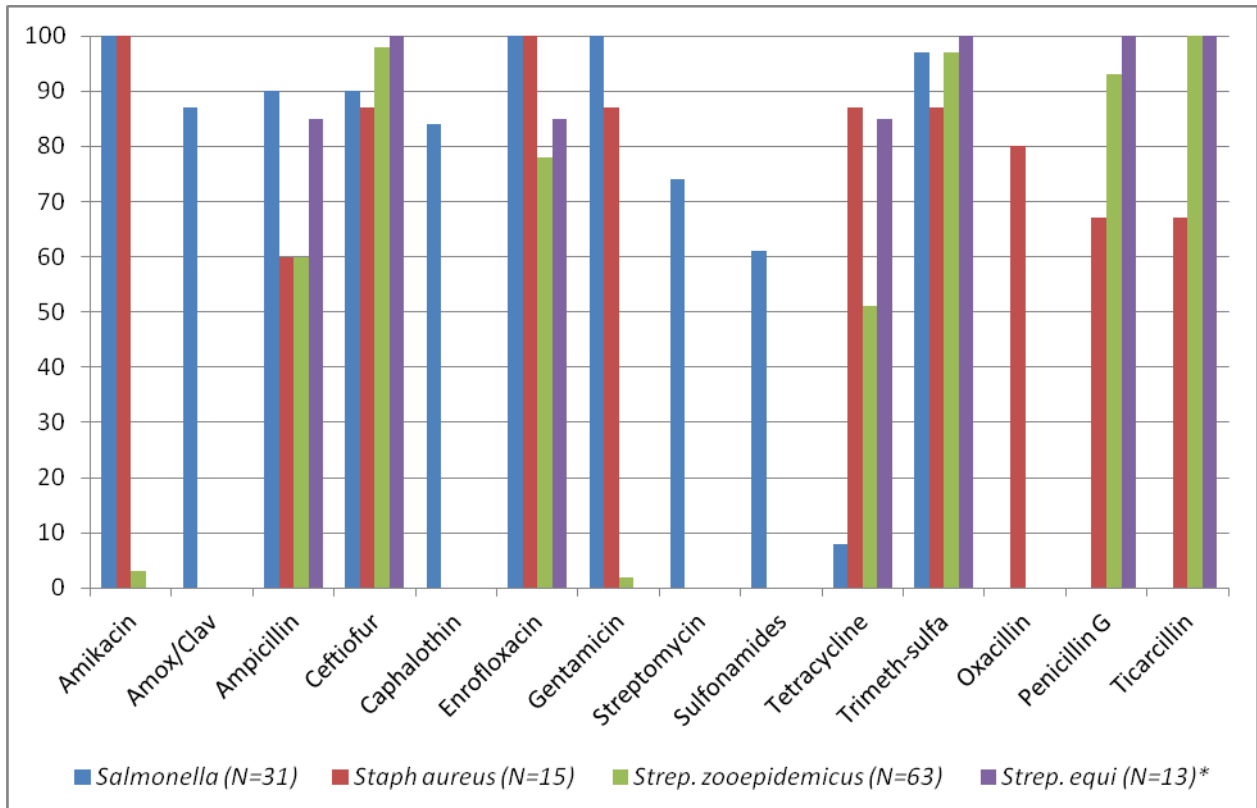
Percent of Susceptible Canine Isolates From All Sample Types between 7/1/2013 – 6/30/2014.



\*Drug not tested is shown as 0% except for Amox-Clav and *Pseudomonas aeruginosa* (true 0% susceptible).



Percent of Susceptible Equine Isolates From All Sample Types between 7/1/2013 – 6/30/2014.  
 Drug not tested is shown as 0%.



\*Drug not tested is shown as 0% except for Amikacin/Gentamicin and *Strep. equi* (true 0% susceptible).

## VIROLOGY

These tables indicate the number of different tests done for viruses by virology and molecular diagnostics for the last two fiscal years, and the last columns indicate the percent change of fiscal year 13/14 compared to fiscal year 12/13. The middle column of some tables indicate the number (and percentage) of positive tests.

### BOVINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/13-6/14	Number Positive	Number 7/12-6/13	% Change
BVDV	VI	169	18 (10.7)	141	19.9
BVDV	PCR	524	5 (1.0)	418	25.4
BVDV	IHC	34	0 (0.00)	23	47.8
BVDV	FA	488	39 (8.0)	500	-2.4
BVDV	cELISA or SNAP	422	2 (0.5)	867	-51.3
IBRV	VI	169	6 (3.6)	141	19.9
IBRV	FA	374	72 (19.3)	316	18.4
BHV	PCR	221	8 (3.6)	100	121.0
BRSV	VI	169	0 (0.0)	141	19.9
BRSV	PCR	3	0 (0.0)	13	-76.9
BRSV	FA	81	0 (0.0)	66	22.7
PI3	VI	169	0 (0.0)	141	19.9
PI3	FA	80	0 (0.0)	67	19.4
Coronavirus	FA	109	6 (5.5)	219	-50.2
Rotavirus	ELISA	115	28 (24.3)	218	-47.2
Chlamydia	PCR	1	0 (0.0)	3	-66.7
Bluetongue	PCR	14,975	1,626 (10.9)	2,376	530.3
EHD	PCR	77	0 (0.0)	95	-18.9
Mycoplasma	PCR	87	60 (69.0)	66	31.8
OHV-2	PCR	8	6 (75.0)	25	-68.0
BLV	PCR	3,952	273 (6.9)	45	8682.2
<b>TOTALS</b>	--	<b>21,720</b>	--	<b>5,558</b>	<b>290.8</b>

### BOVINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/13-6/14	Number 7/12-6/13	% Change
BVD-I	SN	931	576	61.6
BVD-II	SN	928	575	61.4
BRSV	SN	34	35	-2.9
IBR	SN	734	544	34.9
PI-3	SN	98	51	92.2
VSV (2 strains)	SN	204	244	-16.4
BLV	AGID	24 <sup>a</sup>	311	-92.3
BT/EHD	AGID or cELISA	45 <sup>b</sup>	157	-71.3
<b>TOTALS</b>		<b>2,998</b>	<b>2,493</b>	<b>20.3</b>

<sup>a</sup> 6/24 (25.0%) positive

<sup>b</sup> 10/45 (22.2%) positive

### EQUINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/13-6/14	Number Positive (%)	Number 7/12-6/13	% Change
<b>EHV-1</b>	VI	1	0 (0.0)	5	-80.0
<b>EHV-1</b>	FA	9	0 (0.0)	1	80.0
<b>EHV-1/-4</b>	PCR	228	8 (3.5)	286	-20.3
<b>Influenza</b>	PCR	89	5 (5.6)	36	147.2
<b>West Nile</b>	PCR	19	1 (5.3)	9	111.1
<b>EVA</b>	PCR	30	0 (0.0)	20	50.0
<b>Rotavirus</b>	ELISA	19	0 (0.0)	13	46.2
<b>TOTALS</b>		<b>395</b>	<b>--</b>	<b>370</b>	<b>6.8</b>

### EQUINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/13-6/14	Number 7/12-6/13	% Change
<b>EHV-1</b>	SN	70	120	-41.7
<b>EHV-4, EHV-3</b>	SN	43	66	-34.8
<b>EVA</b>	SN	138	203	-32.0
<b>Influenza/A1&amp;A2</b>	HI	28	58	-51.7
<b>EIA</b>	AGID or ELISA	4,185 <sup>a</sup>	3,765	11.2
<b>VSV</b>	SN(2 strains)	26	30	-13.3
<b>West Nile</b>	IgM ELISA	97 <sup>b</sup>	95	2.1
<b>TOTALS</b>		<b>4,587</b>	<b>4,337</b>	<b>5.8</b>

<sup>a</sup> Zero positive

<sup>b</sup> 23/97 (23.7%) positive

### PORCINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/13-6/14	Number Positive (%)	Number 7/12-6/13	% Change
<b>Influenza</b>	PCR	0	0 (0.0)	0	0.0
<b>Mycoplasma</b>	PCR	3	1 (33.3)	1	200.0
<b>Rotavirus</b>	ELISA	2	0 (0.0)	6	-66.7
<b>PPV</b>	FA	12	0 (0.0)	7	71.4
<b>PRRS</b>	PCR	4	0 (0.0)	2	100.0
<b>TGE</b>	FA	2	0 (0.0)	1	100.0
<b>TOTALS</b>		<b>23</b>	<b>--</b>	<b>17</b>	<b>35.3</b>

**OVINE/CAPRINE/LLAMA/CERVID/WILDLIFE VIRAL DIAGNOSTICS**

<b>Virus Name</b>	<b>Test Performed</b>	<b>Number 7/13-6/14</b>	<b>Number Positive (%)</b>	<b>Number 7/12-6/13</b>	<b>% Change</b>
<b>BVDV</b>	VI	6	0 (0.0)	3	100.0
<b>BVDV</b>	FA	100	5 (5.0)	84	19.0
<b>BVDV</b>	PCR	418	2 (0.5)	430	-2.8
<b>BVD</b>	SN	98	NA	238	-58.8
<b>BRSV</b>	FA/PCR	14	0 (0.0)	5	180.0
<b>BRSV</b>	SN	114	NA	129	-11.6
<b>IBR</b>	FA/PCR	11	2 (18.2)	13	-15.4
<b>IBR</b>	SN	42	NA	133	-68.4
<b>PI3</b>	FA	8	0 (0.0)	3	166.7
<b>PI3</b>	SN	114	NA	131	-13.0
<b>BT</b>	cELISA/AGID	41	12 (29.3)	134	-69.4
<b>BT</b>	PCR	28	1 (3.6)	86	-67.4
<b>EHD</b>	AGID	3	1 (33.3)	205	-98.5
<b>EHD</b>	PCR	29	2 (6.9)	63	-54.0
<b>EHV</b>	FA/PCR	6	1 (16.7)	14	-57.1
<b>EHV</b>	SN	15	NA	NA	NA
<b>Coronavirus</b>	FA	26	0 (0.0)	8	225.0
<b>Rotavirus</b>	ELISA	34	1 (2.9)	32	6.3
<b>OPP</b>	AGID	270	18 (6.7)	120	125.0
<b>OPP</b>	PCR	11	1 (9.1)	5	120.0
<b>CAE</b>	ELISA/AGID	446	37 (8.3)	367	21.5
<b>CAE</b>	PCR	55	16 (29.1)	71	-22.5
<b>Caprine Herpes</b>	PCR	4	0 (0.0)	6	-33.3
<b>Chlamydia</b>	PCR	68	3 (4.4)	69	-1.4
<b>Mycoplasma</b>	PCR	94	26 (27.7)	16	487.5
<b>OHV-2</b>	PCR	5	1 (20.0)	17	-70.6
<b>West Nile</b>	PCR	4	0 (0.0)	2	100.0
<b>VSV</b>	SN(2 strains)	42	NA	72	-41.7
<b>TOTAL</b>		<b>2,106</b>	<b>--</b>	<b>2,456</b>	<b>-14.3</b>

**FELINE VIRAL DIAGNOSTICS**

<b>Virus Name</b>	<b>Test Performed</b>	<b>Number 7/13-6/14</b>	<b>Number Positive (%)</b>	<b>Number 7/12-6/13</b>	<b>% Change</b>
<b>FHV-1 (Herpes)</b>	PCR	114	11 (9.6)	119	-4.2
<b>FHV-1</b>	VI	0	0 (0.0)	84	-100.0
<b>Calicivirus</b>	PCR	36	6 (16.7)	44	-18.2
<b>FPV (Panleukopenia)</b>	SNAP/PCR	27	9 (33.3)	23	17.4
<b>FeLV</b>	ELISA	120	4 (3.3)	114	5.3
<b>FIV</b>	ELISA	120	6 (5.0)	114	5.3
<b>FIV</b>	PCR	32	14 (43.8)	66	-51.5
<b>Chlamydia</b>	PCR	101	19 (18.8)	88	14.8
<b>Mycoplasma</b>	PCR	49	23 (46.9)	60	-18.3
<b>Corona/FIP</b>	PCR/FA	35	1 (2.9)	37	-5.4
<b>Influenza</b>	PCR	7	0 (0.0)	NA	NA
<b>TOTALS</b>		<b>641</b>	<b>--</b>	<b>749</b>	<b>-14.4</b>

### FELINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/13-6/14	Number 7/12-6/13	% Change
<b>FIP</b>	IFA	40	49	-18.4
<b>FCV</b>	SN	236	401	-41.1
<b>FHV</b>	SN	256	456	-43.9
<b>FPV</b>	HI	1,240	1,512	-18.0
<b>TOTALS</b>		<b>1,772</b>	<b>2,418</b>	<b>-26.7</b>

### CANINE VIRAL DIAGNOSTICS

Virus Name	Test Performed	Number 7/13-6/14	Number Positive (%)	Number 7/12-6/13	% Change
<b>CDV (Distemper)</b>	FA	266*	39 (14.7)*	77	245.5
<b>CDV</b>	PCR	914	257 (28.1)	891	2.6
<b>CCV (Corona)</b>	FA	26	2 (7.7)	31	-16.1
<b>CPV (Parvo)</b>	FA/SNAP/PCR	50	15 (30.0)	45	11.1
<b>CHV (Herpes)</b>	VI	0	0 (0.0)	0	0.0
<b>CHV</b>	FA/PCR	32	9 (28.1)	20	60.0
<b>ICH (Adenovirus)</b>	PCR	5	0 (0.0)	3	66.7
<b>Influenza</b>	PCR	12	0 (0.0)	41	-70.7
<b>Mycoplasma</b>	PCR	39	12 (30.8)	33	18.2
<b>TOTALS</b>		<b>1,344</b>	<b>--</b>	<b>1,141</b>	<b>17.8</b>

\* 187/266 (70.3%) are raccoons or other exotics/wildlife, 21 (11.2%) positive.

### CANINE VIRAL SEROLOGY

Virus Name	Test Performed	Number 7/13-6/14	Number 7/12-6/13	% Change
<b>CDV</b>	SN	7,457	8,889	-16.1
<b>CDV IgG/IgM</b>	IFA	200	229	-12.7
<b>CHV</b>	SN	77	55	40.0
<b>CPV</b>	HI	7,039	8,448	-16.7
<b>Influenza</b>	HI	7	17	-58.8
<b>TOTALS</b>		<b>14,780</b>	<b>17,638</b>	<b>-16.2</b>

## RABIES TESTING

Species	Number 7/13-6/14	Number Positive	Number 7/12-6/13
<b>Bat</b>	90	11	84
<b>Bovine/Llama/Caprine/Ovine</b>	49	1	34
<b>Canine</b>	119	0	135
<b>Coyote/Fox</b>	41	2	24
<b>Deer/Elk</b>	4	0	4
<b>Equine/Burro</b>	73	6	29
<b>Feline</b>	109	1	63
<b>Lynx/Mt Lion</b>	4	0	6
<b>Bear</b>	8	0	5
<b>Rabbit/Rodent/Unknown</b>	23	0	17
<b>Raccoon</b>	103	1	47
<b>Skunk</b>	37	19	64
<b>TOTALS</b>	<b>660</b>	<b>41</b>	<b>512</b>

## AVIAN DIAGNOSTICS

The table below indicates the number of different tests done by the Avian Diseases Section for the last two fiscal years and the last column indicates the percent change of fiscal year 13/14 compared to fiscal year 12/13. The middle column indicates the number (and percent) of positive tests. Necropsy is also listed in Pathology.

Agent Name	Test Performed	Number 7/13-6/14	Number Positive (%)	Number 7/12-6/13	% Change
<b>Influenza</b>	AGID/HI	2,448	NA	3,255	-24.8
<b>Influenza</b>	PCR	1,197	NA	1,155	3.6
<b>Any</b>	VI	0	NA	43	-100.0
<b>Infectious Bronchitis</b>	ELISA	0	0 (0.0)	0	0.0
<b>West Nile</b>	PCR	29	12 (41.4)	30	-3.3
<b>APMV-1</b>	PCR	19	1 (5.3)	67	-71.6
<b>Chlamydia</b>	PCR	12	0 (0.0)	14	-14.3
<b>Mycoplasma (MG/MS)</b>	PCR	88	45 (51.1)	43	104.7
<b>Mycoplasma</b>	Serology	6	0 (0.0)	19	-68.4
<b>Pullorum/ Typhoid</b>	Serology	2,116	NA	1,932	9.5
<b>Salmonella Mortality/Egg/ Environmental</b>	Culture	535	NA	516	3.7
<b>Salmonella Enteritidis</b>	PCR	111	NA	0	NA
<b>Newcastle Disease</b>	Serology or PCR	1	0 (0.0)	4	-75.0
<b>Any</b>	Necropsy	176	NA	167	5.4
<b>TOTALS</b>		<b>6,738</b>		<b>7,245</b>	<b>-7.0</b>

## BSL3 TESTING

Below are tests performed in the BSL3 (Biosafety Level 3) section, usually in conjunction with testing through the National Animal Health Laboratory Network (NAHLN) overseen by the United States Department of Agriculture or with the Laboratory Response Network overseen by the Center for Disease Control. The last column indicates the percent change of test numbers of FY 13/14 compared to FY 12/13.

Agent Name	Test Performed	Number 7/13-6/14	Number Positive	Number 7/12-6/13	% Change
Classical Swine Fever	PCR	758	0 (0.0)	598	26.8
H1N1 Influenza	PCR	59	0 (0.0)	12	391.7
Q Fever ( <i>Coxiella burnetii</i> )	ELISA	128	26 (20.3)	NA	NA
Q Fever ( <i>Coxiella burnetii</i> )	IFA	247	NA	NA	NA
Q Fever ( <i>Coxiella burnetii</i> )	PCR	697	9 (14.1)	85	720.0
Piroplasmosis ( <i>B. caballi</i> ; <i>T. equi</i> )	cELISA	911	0 (0.0)	885	2.9
Vesicular Stomatitis	Complement fixation	34	4 (11.8)	4	750.0
<i>Francisella tularensis</i>	PCR	14	0 (0.0)	28	-50.0
<i>Yersinia pestis</i>	PCR	23	1 (4.3)	34	-32.4
<i>Bacillus anthracis</i>	PCR	10	0 (0.0)	40	-75.0
<i>Brucella</i> sp.	PCR	417	0 (0.0)	21	1885.7
Pseudorabies	ELISA	1	0 (0.0)	0	100.0
Foot & Mouth Disease	PCR	0	0 (0.0)	0	0.0
Rinderpest	PCR	0	0 (0.0)	0	0.0
Contagious Bovine Pleuropneumonia*	PCR	133	NA	NA	NA
Lumpy Skin Disease*	PCR	125	NA	NA	NA
Salmonella spp	PCR	1	1 (100.0)	155	-99.4
OTHER	RNA Extraction & Sequencing	306	NA	NA	NA
<b>TOTAL</b>		<b>3,864</b>	<b>--</b>	<b>1,862</b>	<b>107.5</b>

\* Negative cohort studies

## PARASITOLOGY

This table indicates the number of different tests done for the last two fiscal years. The last column indicates the percent change of fiscal year 13/14 compared to fiscal year 12/13.

Test	Number 7/13-6/14	% of Total	Number 7/12-6/13	% Change
<b>Trich - Culture Food Animal</b>	847	9.8	714	18.6
<b>Trich - PCR Food Animal</b>	578 (individual) 162 (pools of 5)	8.6	603 (individual) 199 (pools of 5)	-7.7
<b>Trich - Culture Small Animal</b>	26	0.3	28	-7.1
<b>Trich - PCR Small Animal</b>	152	1.8	170	-10.6
<i>Neospora</i> <b>Serology</b>	496	5.8	464	6.9
<i>Toxoplasma</i> <b>Serology</b>	86	1.0	45	91.1
<b>Knott's Test</b>	13	0.2	12	8.3
<b>Heartworm Serology</b>	685	8.0	502	36.5
<i>Ehrlichia/Lyme/ Anaplasma</i>	1050(350 each)	12.2	585(195 each)	79.5
<b>Parasite ID</b>	53	0.6	40	32.5
<b>Fecal Exam</b>	2,758	32.0	2,516	9.6
<i>Giardia</i> <b>ELISA/IFA</b>	437	5.1	644	-32.1
<i>Cryptosporidium</i> <b>AF/IFA</b>	611	7.1	853	-28.4
<b>Baermann</b>	364	4.2	86	323.3
<b>Fluke exam</b>	7	0.1	2	250.0
<b>Giardia/Crypto PCR</b>	4	0.0	14	-71.4
<b>Soil Analysis (includes feed, water, sediment)</b>	23	0.3	24	-4.2
<b>Occult Blood</b>	47	0.5	45	4.4
<b>Strongyle/ Nematode PCR</b>	69	0.8	96	-28.1
<b>Bovine Coccidia ID</b>	37	0.4	474	-92.2
Special Request/ Other	111	1.3	NA	NA
<b>TOTAL</b>	<b>8,616</b>	<b>100.0</b>	<b>8,116</b>	<b>6.2</b>



## PARASITOLOGY

The following tables indicate the results of fecal examinations for the listed host group. Results are given as the number of samples positive over the number of fecal specimens examined with the percentages in parentheses.

### COMPANION ANIMAL/EXOTICS FECAL EXAMINATIONS

Species	Ascarids	Hookworms	Whipworms	Coccidia	Lungworms / <i>Strongyloides</i>	Other
<b>Canine (includes wild species)</b>	16/1017 (1.6)	16/1017 (1.6)	6/1017 (0.6)	36/1017 (3.5)	0/10 (0.0)	12/1017 (1.2)
<b>Feline (includes wild species)</b>	5/268 (1.9)	0/268 (0.0)	0/268 (0.0)	4/268 (1.5)	0/2 (0.0)	2/268 (0.7)
<b>Reptiles/Zoo/Other</b>	1/30 (3.3)	0/30 (0.0)	0/30 (0.0)	3/30 (10.0)	0/2 (0.0)	2/30 (6.7)

### FOOD & FIBER ANIMALS/EQUINE FECAL EXAMINATIONS

Species	Ascarids	Coccidia	Strongyles	<i>Nematodirus</i>	<i>Trichuris</i>	Tapeworms	Other	Lungworms
<b>Bovine</b>	- <sup>a</sup>	128/185 (69.2)	121/185 (65.4)	25/185 (13.5)	25/185 (13.5)	3/185 (1.6)	1/185 (0.5)	0/0 (0.0)
<b>Ovine/ Caprine</b>	-	136/177 (76.8)	86/177 (48.6)	28/177 (15.8)	24/177 (13.6)	11/177 (6.2)	2/177 (1.1)	0/3 (0.0)
<b>Camelids</b>	-	141/152 <sup>b</sup> (92.8)	33/152 (21.7)	42/152 (27.6)	28/152 (18.4)	3/152 (2.0)	19/152 (12.5)	0/1 (0.0)
<b>Cervids/ Wildlife/Zoo</b>	0/397 (0.0)	110/397 (27.7)	277/397 (69.8)	49/397 (12.3)	23/397 (5.8)	81/397 (20.4)	6/397 (1.5)	3/343 (0.9)
<b>Equine</b>	14/523 (2.8)	3/523 (0.6)	218/523 (41.7)	--	--	6/523 (1.1)	1/523 (0.2)	0/3 (0.0)

<sup>a</sup> dash = not applicable

<sup>b</sup> more than 1 species in many samples

69 Strongyle PCR were performed on bovines. There were 63/69 (91.3%) *Cooperia*, 55/69 (79.7%) *Haemonchus*, 31/69 (44.9%) *Oesophagostomum*, 37/69 (53.6%) *Ostertagia*, and 10/69 (14.5%) *Trichostrongylus*.

## PARASITOLOGY

The following table indicates the results of fecal tests for *Cryptosporidium* and *Giardia* using various methods.

Species	<i>Giardia</i> (Fecal Exam)	<i>Giardia</i> (ELISA)	<i>Giardia</i> (IFA)	<i>Cryptosporidium</i> (Acid-fast)	<i>Cryptosporidium</i> (IFA)
<b>Canine</b>	43/1017 (4.2)	0/0 (0.0)	37/241 (15.4)	0/70 (0.0)	30/241 (12.4)
<b>Feline</b>	3/268 (1.1)	0/0 (0.0)	3/98 (3.1)	0/1 (0.0)	2/98 (2.0)
<b>Bovine/Caprine/ Ovine/Porcine</b>	3/367 (0.8)	— <sup>a</sup>	17/21 (81.0)	23/101 (22.8)	1/21 (4.8)
<b>Camelids</b>	1/152 (0.7)	--	0/2 (0.0)	0/0 (0.0)	0/2 (0.0)
<b>Equine</b>	0/523 (0.0)	--	0/30 (0.0)	0/0 (0.0)	0/30 (0.0)
<b>Reptiles/Zoo/ Wildlife/Other</b>	10/431 (2.3)	--	5/45 (11.1)	0/2 (0.0)	5/45 (11.1)

<sup>a</sup> dash = not applicable

The following table indicates the results for serology, molecular diagnostics and other tests for the listed host group. Results are given as the number of positive tests over the number of tests performed with the percentages in parentheses.

Species	Trich Culture	Trich PCR	Neospora	Knott's Test	Heartworm	<i>Ehrlichia</i> / <i>Lyme</i> / <i>Anaplasma</i>	<i>Toxoplasma</i>
<b>Bovine</b>	0/847 (0.0)	14/740 (1.9)	27/254 (10.6)	— <sup>b</sup>	-	-	-
<b>Canine</b>	0/0 (0.0)	0/2 (0.0)	4/232 (1.7)	0/13 (0.0)	22/629 (3.5)	19/1,041 <sup>c</sup> (1.8)	-
<b>Feline</b>	1/26 (3.8)	35/150 <sup>a</sup> (23.3)	1/6 (16.7)	-	0/56 (0.0)	-	-
<b>Avian/Zoo/ Wildlife</b>	-	0/0 (0.0)	0/4 (0.0)	-	0/0 (0.0)	0/9 (0.0)	11/63 (17.5)

<sup>a</sup> Includes all trichomonads.

<sup>b</sup> dash = not applicable

<sup>c</sup> 3 Anaplasmosis, 10 Ehrlichia, 6 Lyme positive

- There were 23 tests for Toxoplasmosis in ovine, caprine, and equine; 1 (4.3%) was positive.

## CHEMISTRY/TOXICOLOGY

The top table indicates the number of tests for nutrients or elements performed for the last two fiscal years. The last column of the top table indicates the percent change of fiscal year 13/14 compared to fiscal year 12/13. The bottom table indicates the results of testing for copper for the given species and tissue sample.

<b>Nutrient</b>	<b>Number 7/13-6/14</b>	<b>%</b>	<b>Number 7/12-6/13</b>	<b>% Change</b>
<b>Copper</b>	2,483	58.2	2,007	23.7
<b>Zinc</b>	569	13.3	493	15.4
<b>Iron</b>	546	12.8	500	9.2
<b>Selenium + GSH.Px</b>	290	6.8	470	-38.3
<b>Other trace minerals (Mo,Co,Mn)</b>	63	1.5	88	-28.4
<b>Vitamin A</b>	125	2.9	162	-22.8
<b>Vitamin E</b>	167	3.9	524	-68.1
<b>Macro elements (Ca,Mg,K,Na, P,Cl)</b>	22	0.5	33	-33.3
<b>Special Request</b>	3	0.1	11	-72.7
<b>TOTAL</b>	<b>4,268</b>	<b>100.0</b>	<b>4,288</b>	<b>-0.5</b>

### COPPER

<b>Species</b>	<b>Tissue</b>	<b>TOTAL</b>	<b>Results</b>
<b>Bovine</b>	Serum	119	55 < 0.6 ppm (deficient)
<b>Bovine</b>	Liver	74	3 < 40 ppm (deficient) 14 > 600 ppm (toxic)
<b>Canine</b>	Liver	1,988	265 > 1,500 ppm (toxic)

There were 201/507 (39.6%) canine liver iron > 2000ppm

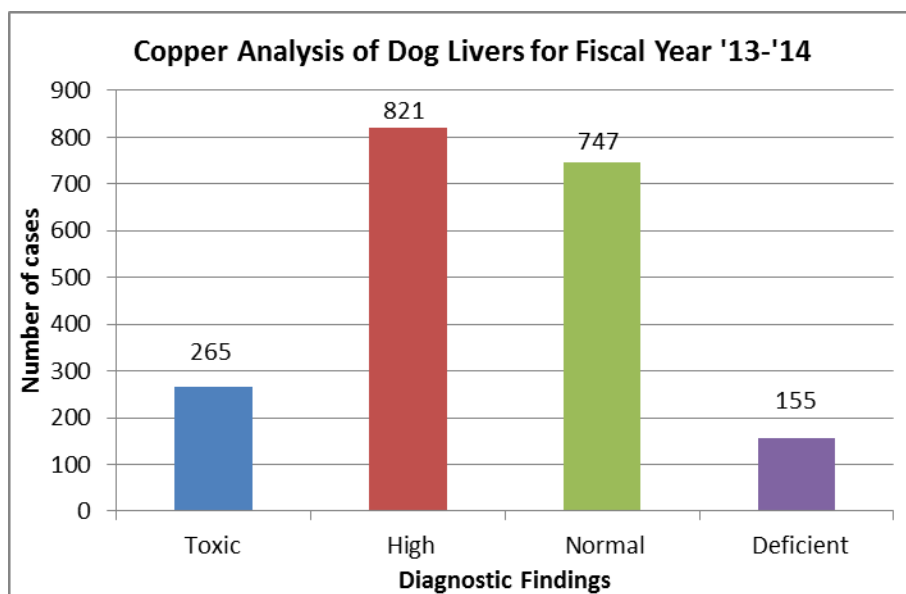
## CHEMISTRY/TOXICOLOGY

This table lists the number of tests for toxicants for the last two fiscal years. The last column of the table indicates the percent change of fiscal year 13/14 compared to fiscal year 12/13.

Toxicant	Number 7/13-6/14	%	Number 7/12-6/13	% Change
Calculi	72	12.6	137	-47.4
Bromide	207	36.2	166	24.7
Cadmium	2	0.3	6	-66.7
Cholinesterase	11	1.9	3	266.7
Cyanide	2	0.3	11	-81.8
Nitrate/Nitrite	105	18.4	94	11.7
Strychnine	7	1.2	6	16.7
Sulfate/Sulfur	0	0.0	60	-100.0
Arsenic	94	16.4	11	754.5
Lead	59	10.3	54	9.3
Mercury	6	1.0	13	-53.8
Alpha-Mannosidase or Swainsonine	7	1.2	2	250.0
Other	0	0.0	13	-100.0
<b>TOTAL</b>	<b>572</b>	<b>100.0</b>	<b>576</b>	<b>-0.7</b>

There was 1 positive strychnine from 7 samples.

There were 4 cases of lead toxicity.



## SPECIAL SEROLOGY

The top table indicates the number of tests performed for the listed species for the last two fiscal years. The percent change of fiscal year 13/14 compared to fiscal year 12/13 is given in parentheses. Toxo stands for Toxoplasmosis and RMSF stands for Rocky Mountain Spotted Fever. The bottom table indicates the number of positive results over the total number of tests done, with the percent in parentheses.

Species	Toxo IgG/M 7/13-6/14	Toxo IgG/M 7/12-6/13 (%change)	Toxo CSF IgG/M 7/13-6/14	Toxo CSF IgG/M 7/12-6/13 (% change)	RMSF IgG 7/13-6/14	RMSF IFA 7/12-6/13 (%change)
<b>Canine</b>	2,721	2,472 (10.1)	78	63 (23.8)	34	16 (112.5)
<b>Feline</b>	4,424	4,033 (9.7)	14	17 (-17.6)	NA	NA
<b>TOTAL</b>	<b>7,145</b>	<b>6,505 (9.8)</b>	<b>92</b>	<b>80 (15.0)</b>	<b>34</b>	<b>16 (112.5)</b>

Species	Positive Toxo IgG	Positive Toxo IgM	Positive Toxo CSF IgM	Positive RMSF IFA
<b>Canine</b>	223/2,721 (8.2)	71/2,721 (2.6)	1/78 (1.3)	2/34 (5.9)
<b>Feline</b>	596/4,424 (13.5)	609/4,424 (13.8)	1/14 (7.1)	NA
<b>TOTAL</b>	<b>819/7,145 (11.5)</b>	<b>680/7,145 (9.5)</b>	<b>2/92 (2.2)</b>	<b>2/34 (5.9)</b>

The table below indicates the number of PCR tests done in the Special Serology section for the last two fiscal years. The number of positive results and the percentages in parentheses is given in the third column. The last column indicates the change in the number of tests from fiscal year 13/14 compared to fiscal year 12/13.

Test	Number 7/13-6/14	Number Positive (%)	Number 7/12-6/13	% Change
IgG Bartonella	31	15 (48.4)	35	-11.4
PCR Bartonella	109	7 (6.4)	88	1.4
PCR Cryptosporidia	15	5 (33.3)	17	-11.8
PCR Giardia	20	1 (5.0)	24	-16.7
PCR <i>M. haemocanis</i> / <i>M. haematoparvum</i>	86	3 (3.5)	24	258.3
PCR <i>M. haemofelis</i> / <i>M. haemominutum</i>	132	12 (9.1)	104	26.9
PCR <i>Neospora caninum</i>	82	2 (2.4)	23	256.5
PCR <i>Toxoplasma gondii</i>	322	1 (0.3)	320	0.6
PCR Ehrlichia/Wolbachia/ Anaplasma/Neorickettsia	664	9 (1.4)	392	69.4
PCR Rickettsia sp.	39	0 (0.0)	11	254.5
<i>E. canis</i> IFA	25	6 (24.0)	28	-10.7
<b>TOTAL</b>	<b>1,525</b>	<b>--</b>	<b>1,066</b>	<b>43.1</b>

## CLINICAL PATHOLOGY

The Clinical Pathology Service is directed by the Veterinary Teaching Hospital, but samples from non-Veterinary Teaching Hospital patients are processed through the Diagnostic Laboratory. The table indicates the number of tests performed for the given species for non-Veterinary Teaching Hospital cases only. Fiscal year 13/14 is compared to fiscal year 12/13 and the percent change is given in parentheses. Overall, there were 8,610 tests in fiscal year 13/14 compared to 7,993 tests in fiscal year 12/13, an increase of 7.7%.

Species	CBC 7/13-6/14	CBC 7/12-6/13 (%change)	Chemistry Panel 7/13-6/14	Chemistry/Panel 7/12-6/13 (%change)	Fluid & Cytology 7/13-6/14	Fluid & Cytology <sup>a</sup> 7/12-6/13 (%change)	Other 7/13-6/14	Other 7/12-6/13 (%change)
<b>Canine</b>	1,105	920 (20.1)	497	545 (-8.8)	4,050	3,644 (11.1)	442	557 (-20.6)
<b>Feline</b>	250	203 (23.2)	125	127 (-1.6)	764	735(3.9)	161	146 (10.3)
<b>Equine</b>	338	306 (10.5)	345	326 (5.8)	85	105 (-19.0)	53	39 (35.9)
<b>Bovine</b>	26	11 (136.4)	106	30(253.3)	3	2 (50.0)	4	0 (100.0)
<b>Other</b>	105	135 (-22.2)	82	80 (2.5)	36	26 (38.5)	23	40 (-42.5)
<b>Avian/ Reptile</b>	4	11 (-63.6)	2	5 (-60.0)	4	0 (100.0)	0	0 (0.0)
<b>TOTAL</b>	<b>1,828</b>	<b>1,586 (15.3)</b>	<b>1,157</b>	<b>1,113 (4.0)</b>	<b>4,942</b>	<b>4,512 (9.5)</b>	<b>683</b>	<b>782 (-12.7)</b>

<sup>a</sup> There were 819 additional site cytologies in FY 13/14 compared to 740 in FY 12/13.

- There were 2,111 submissions of tissue for PCR to detect lymphoid malignancies (compared to 2,104 in FY 12/13), and 2,875 submissions for flow cytometry (compared to 1,876 in FY 12/13).

## ENDOCRINOLOGY

This table indicates the number of tests performed for the listed species for the last two fiscal years. The percent change from fiscal year 13/14 compared to fiscal year 12/13 is given in parentheses. TDM stands for therapeutic drug monitoring, and is primarily for phenobarbital.

Species	Pituitary Adrenal Axis	Pituitary Thyroid Axis	Insulin	Total 7/13-6/14	Total 7/12-6/13 (% change)	TDM 7/13-6/14	TDM 7/12-6/13 (% change)
<b>Equine</b>	245	44	159	448	365 (22.7)	0	0(0.0)
<b>Canine</b>	619	1,195	10	1,824	1,715 (6.4)	247	234 (5.6)
<b>Feline</b>	6	452	0	458	423 (8.3)	9	14 (-35.7)
<b>Other</b>	0	11	0	11	32 (-65.6)	0	0(0.0)
<b>TOTAL</b>	<b>870</b>	<b>1,702</b>	<b>169</b>	<b>2,711</b>	<b>2,535 (6.9)</b>	<b>256</b>	<b>248 (3.2)</b>

## ROCKY FORD

Agent Name	Test Performed	Number 7/13-6/14	Number Positive	% Positive	Number 7/12-6/13	% Change
<b>BLV</b>	ELISA or PCR	12,228	2,690	22.0	58,388	-79.1
<b>BVD</b>	FA	139	19	13.7	107	29.9
<b>BVD PCR Pools</b>	PCR	1,512	92	6.1	1,150	31.5
<b>BVD Samples Pooled</b>	PCR	58,839	NA	NA	39,632	48.5
<b>BVD</b>	C-ELISA	5,434	120	2.2	9,312	-41.6
<b>IBR</b>	FA	105	4	3.8	81	29.6
<b>BT</b>	ELISA	13	0	0	10	30.0
<b>Rota</b>	ELISA	24	6	25.0	35	-31.4
<b>Corona</b>	FA	23	10	43.5	35	-34.3
<b>BRSV</b>	FA	17	3	17.6	23	-26.1
<b>PI3</b>	FA	17	0	0.0	NA	NA
<i>B. abortus</i>	Card Test	17	0	0%	19	-10.5
<i>M. paratuberculosis</i>	ELISA	9,597	9.6	1.0	33,511	-71.4
<b>Trichomonas</b>	Culture	172	0	0.0	281	-38.8
<b>Trichomonas</b>	PCR	6,263	650	10.4	5,479	69.1
<b>Trichomonas pooled</b>	PCR	2,473	203	8.2	3,034	-18.5
<b>Trichomonas control program</b>	PCR	10,986	NA	NA	8,730	25.8
<b>Other Parasites</b>	Fecal Float Exam	116	NA	NA	-	NA
<b>CAE</b>	cELISA/AGID	114	12	10.5	139	-18.0
<b>OPP</b>	cELISA/AGID	1,820	228	12.5	612	197.4
<b>EIA</b>	AGID	5,418	0	0.0	5,615	-3.5
<b>EIA</b>	ELISA	501	0	0.0	577	-13.2
<b>Campylobacter</b>	Culture	1,376	NA	NA	3,451	-60.1
<b>Various Bacteria</b>	Culture	1,672	NA	NA	753	122.0
<b>Nitrate</b>	EMQ Strip	592	NA	NA	742	-20.2
<b>Water Chemistry Panels</b>	Spec./Titration	879	NA	NA	1,378	-36.2
<b>Various</b>	Clinical Pathology	386	NA	NA	368	4.9
<b>Total T4</b>	ELISA	117	NA	NA	193	-39.4
<b>Various</b>	Necropsy	66	NA	NA	46	43.5
<b>TOTAL</b>		<b>120,783</b>			<b>173,701</b>	<b>-30.5</b>

Arkansas Valley  
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## WESTERN SLOPE

Test Performed	Number 7/13-6/14	Number Positive	% Positive	Number 7/12-6/13	% Change
<b>Aerobic culture</b>	444	NA	NA	463	-4.1
<b>Anaerobic culture</b>	50	NA	NA	74	-32.4
<b>Milk culture</b>	254	NA	NA	97	161.9
<b>Antibiotic susceptibility</b>	258	NA	NA	251	2.8
<b>Fungal culture</b>	13	7	53.8	17	-23.5
<b>Campylobacter culture</b>	30	2	6.7	33	-9.1
<b>Mycoplasma culture &amp; other</b>	38	0	0.0	0	100.0
<b>Bovis ELISA</b>	7,907	346 positive 136 indeterminate	4.4 positive 1.7 indeterminate	9,774	-19.1
<i>B. abortus</i>	0	0	0.0	6	-100.0
<i>M. paratuberculosis</i>	0	0	0.0	51	-100.0
<b>EIA (Coggins)</b>	1,775	0	0.0	1,795	-1.1
<b>CAE AGID</b>	1	0	0.0	0	100.0
<b>OPP AGID</b>	0	0	0.0	0	0.0
<b>BVD cELISA/PCR</b>	0	0	0.0	0	0.0
<b>Bluetongue AGID</b>	0	0	0.0	0	0.0
<b>Trichomonas Culture/PCR</b>	3,024	1	0.03	2,233	35.4
<b>Fecal exam</b>	53	NA	NA	64	-17.2
<b>Neospora Serology</b>	0	0	0.0	0	0.0
<b>Chemistry</b>	2	NA	NA	0	100.0
<b>Necropsy</b>	61	NA	NA	60	1.7
<b>Histopathology</b>	588	NA	NA	528	11.4
<b>Cytology</b>	19	NA	NA	8	137.5
<b>TOTAL</b>	<b>14,517</b>	<b>NA</b>	<b>NA</b>	<b>15,454</b>	<b>-6.1</b>

\* 68.6% Food Animal, 2% Equine, 3.9% Wildlife, 25.5% Pets.

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